# Second Five - Year Review Report

For

## CERCLA Sites at Naval Submarine Base New London

Groton, Connecticut



# Naval Facilities Engineering Command Mid-Atlantic

Contract Number N62472-03-D-0057
Contract Task Order 038

December 2006

# SECOND FIVE-YEAR REVIEW REPORT FOR CERCLA SITES AT NAVAL SUBMARINE BASE - NEW LONDON GROTON, CONNECTICUT

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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**DECEMBER 2006** 

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## **Navy Five-Year Review Signature Cover**

## **Key Review Information**

Site Identification			
Site Name: Naval Submar	Site Name: Naval Submarine Base New London EPA ID: CTD980906515		
Region: 1	State: CT	City/County: Groton/	New London
	Site S	Status	
NPL Status: Final			
Remediation Status (unde	er construction, operating, c	omplete): Under Cons	truction and Operating
Multiple OU's* (highlight):	Y N	Number of Sites/OUs:	23/12
Construction Completion I	Date: To be determined		
Has site been put into reu	se? (highlight): Y N		
Review Status			
Lead Agency (EPA, State	Lead Agency (EPA, State, Tribe, Other Federal Agency): Naval Facilities Engineering Command, Mid-Atlantic		
Author Name: Valdis Jurka	Author Name: Valdis Jurka  Author Title: Remedial Project Manager		al Project Manager
Author Affiliation: Departm	nent of the Navy, Naval Fac	ilities Engineering Cor	nmand, Mid-Atlantic
	Review Period: December 2001 to December 2006  Date(s) of Site Inspection: April 4, 2006		ction: April 4, 2006
Type of review: Post-SARA Non-NPL Remedial Acti Regional Discretion	Pre-SARA on Site NPL - Removal C NPL State/Tribe-		Review Number (1, 2, etc) 2
Triggering Action Event: Initiation of the remedial action for Site 2 - Area A Landfill (OU1)			
Trigger Action Date: December, 1996			
Due Date: December, 2006			

<sup>\*</sup> OU refers to Operable Unit

#### Issues:

Deficiencies were noted for Site 2 during the review process and they are as follows: (1) Vegetation continues to grow along the edge of the asphalt covering the plateau, in cracks in the asphalt, and in the riprap covering the sideslopes. The root systems of the vegetation could penetrate the cap system. (2) Sediment, debris, and vegetation clog portions of the drainage channels. If the material is not removed, it may result in surface water overtopping the channels and flowing across the cap system. (3) Two catch basins near the gate at Thresher Avenue are completely blocked with silt and debris. Surface water runoff typically collected by these catch basins is flowing across the landfill and discharging into Channel C. It appears that the offsite runoff is contributing to the debris buildup in Channel C. These catch basins should be cleaned out to minimize any further impacts to Channel C. (4) Heavy equipment continues to be improperly stored on the cap resulting in minor damage to the asphalt. The damage mainly consists of holes/penetrations in the asphalt which may allow surface water to enter the cap drainage layer. This could result in further deterioration of the asphalt during freeze-thaw cycles and underlying cap components. (5) Stored items (concrete barriers, treated timbers, etc.) are blocking access to the monitoring wells. The wells cannot be inspected, maintained, or used for the groundwater monitoring program. Barriers should be placed around the monitoring wells to maintain access to them and restrict storage of items on top of them. (6) Longitudinal cracks continue to form in the asphalt. Many of the cracks have been sealed, but if the new cracks are not sealed, surface water will penetrate the asphalt and further deteriorate the asphalt during freeze-thaw cycles. (7) Monitoring wells that are not part of the groundwater monitoring program have not been maintained or properly abandoned. Two monitoring wells were found to be unprotected (i.e., no protective cover or j-plug), providing a direct conduit to the groundwater aquifer beneath the site. (8) The small depression discovered in the riprap along the toe of the landfill at the northwestern corner during the first five-year review was still evident during the second five-year review. It appears that surface water runoff is channeled through this area which may be causing erosion of material underlying the riprap. If the situation is not addressed, the long-term impact could be that the cap system is impacted in this location. (9) Debris (concrete rubble and furniture) has been dumped on the site. The site was not intended to be used for waste disposal. It is unlikely that the debris will impact the functionality of the cap system, but it should be removed and disposed at an approved off-site disposal facility (i.e., municipal landfill). (10) The gas vents do not have screens on them. The screens will prevent habitation of animals in the vents and prevent unwanted material (e.g., trash) from being deposited in them.

Several deficiencies were noted for Sites 3 and 7 during the review process and they are as follows. (1) New London Instruction 5090.18B was last updated in 2003 and it does not include the latest information from the Land Use Control Remedial Design for Sites 3 and 7 groundwater. The Instruction should be updated to include all relevant information. (2) Maintenance of the existing monitoring wells was not completed and a monitoring well abandonment program was not prepared or implemented. (3) An ESD was not prepared for the contaminated soil encapsulated at Stream 4 in Site 3.

The following O&M deficiencies were noted for Site 6 during the review process: (1) Jersey barriers along the western portion of the site cause water to pond on the cap. (2) The asphalt has a small amount of cracks and depressions. Some depressions are being monitored to determine whether the problem is progressive or stable. (3) Monitoring wells and dedicated sampling equipment should be maintained. (4) Monitoring wells that are not part of the groundwater monitoring program have not been maintained or properly abandoned.

The following minor deficiencies were noted for Site 8 during the review process: (1) Gas vents did not have screens. (2) The sprinkler system was is need of repair. (3) Monitoring wells and dedicated sampling equipment should be maintained. (4) Monitoring wells that are not part of the groundwater monitoring program have not been maintained or properly abandoned. (5) Hazardous material was not properly stored in locked storage lockers.

For Sites 14, 15, and 20 it was identified during the review process that a well abandonment program should be developed and implemented for the monitoring wells at those sites.

## **Recommendations and Follow-Up Actions:**

Sites 1 and 4 were not included in this review, as recommended in the First Five-Year Review Report.

Sites 14, 15, 16, 18, and 20 should not be included in future five-year reviews. NFA decision documents have been prepared for these sites and no additional actions under CERCLA are required. Monitoring wells at Sites 14, 15, and 20 should be properly abandoned.

The recommendations and actions required for Site 2 are as follows: (1) Continue O&M of the site and address the noted O&M deficiencies. (2) Install screens on all gas vents and add an additional jersey barrier for two of the gas vents. (3) Continue the monitoring program, but reduce sampling frequency to annually and further optimize the analytical parameter list, as appropriate. Develop and implement a well abandonment program to eliminate wells that are no longer required for the monitoring program. (4) Develop and implement an equipment storage plan that would organize storage, provide safe methods for storage of equipment on the cap, and eliminate storage of equipment on top of active monitoring wells. (5) Select an appropriate remedial action for the groundwater OU and document the remedy in a Proposed Plan and ROD. (6) Enforce the New London Instruction 5090.18C and at least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews. Consider further restricting access to the site to eliminate dumping of waste on the site. (7) Complete RI/FS process for the Area A Wetland and determine the appropriate remedial action(s). (8) Amend O&M Manual to remove federal AWQC.

The recommendations and actions required for Site 3 are as follows: (1) Continue implementation of the Groundwater Monitoring Plan. (2) Conduct the removal action for Site 3 – NSA. (3) Continue to enforce New London Instruction 5090.18C and at least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews. (4) Maintain the existing monitoring well network and/or properly abandon unnecessary monitoring wells. (5) Prepare an ESD for the contaminated soil encapsulated at Stream 4.

The recommendations and actions required for Site 6 are as follows: (1) Continue O&M of the site and address the noted O&M deficiencies. (2) Continue the monitoring program, but reduce sampling frequency to every two years and further optimize the analytical parameter list, as appropriate. Develop and implement a well abandonment program to eliminate wells that are no longer required for the monitoring program. (3) Develop and implement an equipment storage plan that would prevent storage of equipment on top of active monitoring well(s). (4) Address ponding and sediment buildup due to the jersey barriers. (5) Continue to enforce New London Instruction 5090.18C and at least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews. If the site use changes to yacht club parking, enforcement of New London Instruction 5090.18C should be continued. (6) Amend O&M Manual to remove federal AWQC.

The recommendations and actions required for Site 7 are as follows: (1) Prepare and issue the completion report for the soil remedial action. (2) Continue implementation of the Groundwater Monitoring Plan. (3) Continue to enforce New London Instruction 5090.18C and at least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews. (4) Maintain the existing monitoring well network and/or properly abandon unnecessary monitoring wells.

The recommendations and actions required for Site 8 are as follows: (1) Continue O&M of the site and address the noted O&M deficiencies. (2) Install screens on every gas vent and add locks on the gates of the fencing around two of the gas vents. (3) Continue the Monitoring Program, but reduce sampling frequency to annually and optimize the analytical parameter list, as appropriate. (4) Develop and implement a well abandonment program to eliminate wells that are no longer required for the Monitoring Program. (5) Conduct an inspection of the drains leading into the box culvert (video or by other means).

(6) Select an appropriate remedial action for the groundwater OU and document the remedy in a Proposed Plan and ROD. (7) Continue to enforce New London Instruction 5090.18C and at least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews. (8) Amend O&M Manual to remove federal AWQC.

It is recommended that an NFA PRAP and ROD be completed for Site 9 soil. It is recommended that the decision for the groundwater OU be addressed under Site 23 (Tank Farm).

It is recommended that the FS for the Lower Subase [i.e., Zone 1 (Sites 10 and 11), Zone 2, Zone 3 (Site 17), Zone 4 (Sites 13 and 19), Zone 5 (Site 22), Zone 6 (Site 24), and Zone 7 (Sites 21 and 25)] be completed to determine the appropriate remedial actions for the zones that are protective of human health and the environment. Appropriate decision documents should be prepared after the FS is completed to document the selected remedial alternatives.

It is recommended that the results of the sampling and analysis program of the groundwater collection system be reviewed and evaluated in an RI Update to determine if preparation of an FS for the groundwater OU at Site 23 - Tank Farm is required. Either an FS or an NFA Proposed Plan and ROD should be prepared depending on the results of the evaluation.

It is recommended that New London Instruction 5090.18C be enforced across NSB-NLON.

## **Protectiveness Statement(s):**

Remedial actions to address immediate or potential future threats from exposure to soil and sediment have been implemented at Sites 1, 2 (Area A Landfill), 3, 4, 6, 7, 8, 9, 14, 15, and 20 at NSB-NLON. The remedial actions that were completed at Sites 1 (OU1), 4 (OU10), 7 (OU8), 9, 14 (OU8), 15 (OU6), and 20 (OU7) are protective of human health and the environment. The remedial actions taken at Sites 2 (OU1), 3 (OU3), 6 (OU2), and 8 (OU5) are currently protective of human health and the environment because the cap systems that were installed provide barriers to the waste stored in the landfills or remaining contaminated soil which eliminate direct contact and minimize infiltration of precipitation through the waste and contaminant migration to the underlying groundwater. In order for these remedies to be protective in the long-term, groundwater monitoring, operation and maintenance, and/or land use controls must be maintained at the sites. Groundwater monitoring programs are ongoing at the Sites 2, 6, and 8 to monitor contaminant trends and confirm the protectiveness of the soil remedial actions completed at the sites. An operations and maintenance program has been implemented by the Navy at these sites. The Navy has also instituted an IR Site Use Restriction Instruction that restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

Final remedies have not been selected for the groundwater at Sites 2 (Area A Landfill) (Part of OU9) and 8 (OU5); therefore, a protectiveness determination cannot be made at this time. Groundwater monitoring is currently being conducted to monitor contaminant trends and confirm the protectiveness of the soil remedial actions completed at the sites. Final remedies will be selected for the groundwater when sufficient data has been collected under the monitoring programs.

The selected remedy of groundwater monitoring and land use controls is currently being implemented for the groundwater at Sites 3 and 7 (Part of OU9). The remedy is expected to be protective of human health and the environment when concentrations decrease to below the remedial goals by natural processes, and in the interim, exposure to the contaminated groundwater is being restricted with land use controls to minimize unacceptable risks.

The Navy is continuing CERCLA investigations at Sites 10, 11, 13, 17, 19, 21, 24, and 25. All of the media at these sites are included in OU4. A time-critical removal action was completed at Site 17 to address lead-contaminated soil underneath and adjacent to the building. The action involved excavation and on-site solidification of most of the contaminated soil; however, some contaminated soil was left untreated because of access issues. A protectiveness determination for these sites cannot be made until

final remedies are selected and implemented. It is expected that remedies for these sites will be selected and construction begun prior to the completion of the Third Five-Year Review.

The Navy is also continuing CERCLA investigations at Sites 2 (Area A Wetland) (OU12) and Site 23 (Part of OU9). A protectiveness determination for these sites cannot be made until final remedies are selected and implemented. It is expected that remedies for these sites will be selected and construction begun prior to the completion of the Third Five-Year Review.

Investigations found that no contamination was present in the soil at Sites 16 and 18 (OU11) or the groundwater at Sites 14, 15, 18, and 20 (Part of OU9) that would result in immediate or potential future threats and NFA RODs were subsequently prepared for these sites. The selected remedies are protective of human health and the environment.

#### Other Comments:

In accordance with Navy guidance, the five-year review completed for NSB-NLON included all relevant CERCLA/IRP sites, regardless of whether decision documents have been prepared for the sites. It is believed that inclusion of all of the sites in this Second Five-Year Review Report will simplify preparation of future five-year review reports.

#### **Next Review:**

The next five-year review of NSB-NLON sites will be completed by December 2011.

Signature of U.S. Department of the Navy and Date

Mark S. Ginda, CAPT, USN

Commanding Officer

Naval Submarine Base - New London

12/20/06

Date

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## **ACRONYMS**

ARAR Applicable or Relevant and Appropriate Requirement

AS/SVE Air sparging/soil vapor extraction

AST Above-ground storage tank

Atlantic Environmental Services, Inc.

AVS Acid volatile sulfide

AWQC Ambient Water Quality Criterion

B&RE Brown and Root Environmental

BAF Bioaccumulation factor
BEHP bis(2-Ethylhexyl) phthalate

BGOURI Basewide Groundwater Operable Unit Remedial Investigation

bgs Below ground surface

BTEX benzene, toluene, ethylbenzene, and xylenes

CBU Construction Battalion Unit

CERCLA Comprehensive Response, Compensation, and Liability Act

CFR Code of Federal Regulations
CGS Connecticut General Statutes

cm/secCentimeters/secondCMPCorrugated metal pipeCOCChemical of concern

COD Chemical oxygen demand
COPC Chemical of potential concern

CPAH Carcinogenic polynuclear aromatic hydrocarbon

CQA Construction Quality Assurance
CQC Construction Quality Control

CSF Cancer slope factor

CTDEP Connecticut Department of Environmental Protection

CTE Central tendency exposure

DCE Dichloroethene

DDD p,p'-Dichlorodiphenyl dichloroethane
DDE p,p'-Dichlorodiphenyl dichloroethylene
DDT p,p'-Dichlorodiphenyl trichloroethane

DDTR DDT and its derivatives (e.g., DDD, and DDE)

DGI Data Gap Investigation
DoD Department of Defense

DRMO Defense Reutilization and Marketing Office

ECC Environmental Chemical Corporation
ECOC Ecological contaminant of concern
EE/CA Engineering Evaluation/Cost Analysis
EFANE Engineering Field Activity Northeast
ELUR Environmental Land Use Restriction

E. O. Executive Order

ERA Ecological Risk Assessment

ER-L Effects range-low

ER-M Effects range-medium

ERM Environmental Resource Management
ESD Explanation of Significant Difference
ESQD Explosive Safety Quantity Distance

FAC Facultative

FACW Facultative wetland

FFA Federal Facilities Agreement

FFDC Federal Food, Drug, and Cosmetics

FFS Focused Feasibility Study

FR Federal Register
FS Feasibility Study

FWEC Foster Wheeler Environmental Corporation

GCL Geosynthetic clay liner

GMR Groundwater Monitoring Report
GZA Goldberg-Zoino & Associates

HASP Health and Safety Plan

HHRA Human health risk assessment

HI Hazard Index

HNUS Halliburton NUS Corporation

HQ Hazard Quotient

IAS Initial Assessment Study

IEUBK Integrated Exposure Uptake Biokinetic

ILCR incremental lifetime cancer risk

IR Installation Restoration IRA Interim remedial action

 $\begin{array}{ll} \text{IRP} & \text{Installation Restoration Program} \\ \text{K}_{\text{oc}} & \text{organic carbon partition coefficent} \\ \end{array}$ 

LDPE Low-density polyethylene
LIR Landfill Inspection Report

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LLDPE Linear low-density polyethylene

LOAEL lowest-observed adverse-effect level

MCL Maximum Contaminant Level MQA Material Quality Assurance

MWR Morale, Welfare, and Recreation

NACIP Navy Assessment and Control of Installation Pollutants

NAVD 88 North American Vertical Datum of 1988

NCP National Contingency Plan

NEESA Naval Energy and Environmental Support Activity

NESHAP National Emissions Standards for Hazardous Air Pollutants

NESO Naval Environmental Support Office

NEX Naval Exchange
NFA No further action

NMOC Non-methane organic compounds

NOAA National Oceanographic and Atmospheric Administration

NOAEL No-observed-adverse-effects level

NPDES National Pollution Discharge Elimination System

NPL National Priorities List

NSA New Source Area

NSB-NLON Naval Submarine Base - New London

NTCRA Non-time critical removal action

O&M Operation and maintenance

OBDA Overbank Disposal Area

OBDANE Overbank Disposal Area Northeast

OBL Obligate wetland

OME Ontario Ministry of the Environment

ORP Oxidation-reduction potential

OSWER Office of Solid Waste and Emergency Response

OT Oil tank

OU Operable unit

OVA Organic vapor analyzer

PAH Polynuclear aromatic hydrocarbon

PCB Polychlorinated biphenyl

PCE Tetrachloroethene

PPE Personal protective equipment
PRAP Proposed Remedial Action Plan
PRG Preliminary Remediation Goal

QA Quality assurance

QC Quality control

RAB Restoration Advisory Board
RAC Remedial Action Contractor
RAO Remedial action objective
RBC Risk-Based Concentration

RCRA Resource Conservation and Recovery Act
RCSA Regulations of Connecticut State Agencies

RfD Reference dose

RFI RCRA Facility Investigation

RI Remedial Investigation

RME Reasonable maximum exposure

ROD Record of Decision

RSR Remediation Standard Regulations (Connecticut)
SAIC Science Applications International Corporation

SASDA Spent Acid Storage and Disposal Area

SEM Simultaneous extracted metals
SVOC Semivolatile organic compound
SWMU Solid Waste Management Unit
SWPC Surface Water Protection Criteria

TAL Target Analyte List
TBC To be considered
TCE Trichloroethene

TCL Target Compound List

TCLP Toxicity Characteristic Leaching Procedure

TCRA Time-critical removal action

TDS Total dissolved solids

TIE Toxicity Identification Evaluation

TOC Total organic carbon

TPH Total petroleum hydrocarbons
TSCA Toxic Substances Control Act

TSS Total suspended solids

TtEMI Tetra Tech EMI, Inc.

TtNUS Tetra Tech NUS, Inc.

TtFW Tetra Tech Foster Wheeler, Inc.

USEPA United States Environmental Protection Agency

UST Underground storage tank

## REVISION 1 DECEMBER 2006

VOC Volatile organic compound

WQC Water quality criterion WQS Water quality standard

WQSV Water-quality screening value

#### 1.0 INTRODUCTION

The Navy, in conjunction with the United States Environmental Protection Agency (USEPA) Region I and Connecticut Department of Environmental Protection (CTDEP), conducted the second five-year review of the remedial actions implemented at the Naval Submarine Base-New London (NSB-NLON) in New London County, Connecticut. The National Superfund electronic database identification number for NSB-NLON is CTD980906515.

This Second Five-Year Review Report was prepared by Tetra Tech NUS, Inc. (TtNUS) for Engineering Field Activity Northeast (EFANE) Naval Facilities Engineering Command under Contract Task Order 038 of Contract Number N62472-03-D00057. TtNUS conducted the five-year review of the completed, ongoing, and pending remedial actions at 21 of the 23 Installation Restoration Program (IRP) sites at NSB-NLON from February through June 2006. Two sites (Site 1 – CBU Drum Storage Area and Site 4 – Rubble Fill at Bunker A-86) were not included in the second five-year review based on the recommendations of the First Five-Year Review Report. A general site location map of NSB-NLON is shown on Figure 1-1 and the locations of the sites are shown on Figure 1-2.

#### 1.1 PURPOSE

The purpose of the five-year review is to evaluate the implementation and performance of the remedies at the sites to determine whether the remedies are protective of human health and the environment. The methods, findings, and conclusions of the reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and provide recommendations to address them.

This five-year review is required by statute. The Navy must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section §121(c), as amended, states

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP Part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

This is the second five-year review of NSB-NLON. The triggering action for this review was the initiation of the remedial action for Site 2 - Area A Landfill and Wetlands (soil), which began in December 1996. Because hazardous substances remain at the site above levels that allow for unrestricted use and unlimited exposure, subsequent five-year reviews are required.

As discussed in the USEPA Comprehensive Five-Year Review Guidance (USEPA, 2001), a five-year review determines whether the remedy at a site is protective of human health and the environment. When a remedial action is still under construction, a five-year review determines whether immediate threats have been addressed and whether the remedy is expected to be protective when all remedial actions are completed. In addition, a five-year review identifies any deficiencies and recommends steps to correct them. To do this, the technical assessment conducted during a five-year review examines the three questions shown below.

- Question A: Is the remedy functioning as intended by the decision documents?
- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

These questions will be answered for the sites at NSB-NLON where a remedy has been implemented or is currently being implemented in Sections 2.0 through 22.0. To answer these questions, this five-year review included several steps. The review included a review of documents, discussions with personnel associated with the sites, and a site inspection of NSB-NLON. This report also includes the findings of the review of newly promulgated standards, and changes in the standards that were identified as applicable or relevant and appropriate requirements (ARARs), to be considereds (TBCs), and the factors used to develop site-specific, risk-based levels at the time the Record of Decision (ROD) was signed. This information was reviewed to determine if changes since the time of the ROD may call into question the protectiveness of the remedy. It was determined that recalculation of risk or a risk assessment was not necessary to determine whether a remedy protects human health and the environment, as will be discussed in later sections. Where applicable, monitoring and sampling data and the documentation of

operation and maintenance (O&M) were also examined and the information is included in the subsequent site-specific sections.

#### 1.2 OVERVIEW OF NSB-NLON

NSB-NLON currently provides base command for submarine activities in the Atlantic Ocean. It also provides housing for Navy personnel and their families and supports submarine training facilities, military offices, medical facilities, and facilities for submarine maintenance, repair, and overhaul. The following sections provide the physical and geologic conditions at NSB-NLON as well as a history and chronology.

### 1.2.1 Land Use

NSB-NLON is located in southeastern Connecticut in the towns of Ledyard and Groton. NSB-NLON is situated on the east bank of the Thames River, approximately 6 miles north of Long Island Sound. It is bordered on the east by Connecticut Route 12, on the south by Crystal Lake Road, and on the west by the Thames River. The northern border is a low ridge that trends approximately east-southeast from the Thames River to Baldwin Hill.

Currently, NSB-NLON consists of over 300 buildings on 687 acres of land (Atlantic, 1992). The density of buildings is high along the central bedrock high, in the southern valley, and along the Thames River. In the northern valley are streams, a wetland, and a golf course. The northern bedrock high is not heavily developed except along the southern face at the Area A Weapons Center and the Torpedo Shops. The top and northern faces of the northern ridge are wooded, undeveloped areas.

Land use adjacent to the base is residential and commercial. Residential development along Military Highway, Sleepy Hollow, Long Cove Road, and Pinelock Drive borders the site to the north and extends northward into the Gales Ferry section of Ledyard. Property along Route 12 which is east of the base consists of widely spaced private homes and open, wooded land. Development is mixed commercial and residential farther south on Route 12. This area includes a church, automobile sale and repair facilities, convenience stores, restaurants, and a gas station. Private residences and an automobile service station, are located along the southern side of Crystal Lake Road. Housing for Navy personnel exists farther south of Crystal Lake Road.

### 1.2.2 History and Site Chronology

Important NSB-NLON historical events and relevant dates in the site chronology are listed in the following table. The identified events are illustrative, not comprehensive.

Event	Date
State of Connecticut donates 112-acres on the east bank of the Thames River to the Navy	1867
Navy officially designates property as a Navy Yard	1868
Navy designates site as a Submarine Base	1916
Six piers and 81 buildings were added	World War I
Submarine school established	1917
Submarine Medical Center founded	1918
180 buildings built and land acquired adjacent to site	1935 to 1945
Medical Research Laboratory was established	1946
Submarine School became largest tenant	1968
Naval Submarine Support Facility established	1974
Naval Undersea Medical Institute established	1975
First environmental study for investigation of oil contamination of groundwater	1979
Navy initiated the Naval Assessment and Control of Installation Pollutants (NACIP) Program	1980
Initial Assessment Study completed	1983
U.S. Department of Defense (DOD) developed the IR Program which was the catalyst for environmental investigations at NSB-NLON	1986
Inclusion of NSB-NLON on the Federal Agency Hazardous Waste Compliance Docket	1988
USEPA proposes that NSB-NLON be added to the National Priorities List (NPL)	1989
Placed on the NPL	August 1990
Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) completed	1992
Phase I Remedial Investigation (RI) completed	1992
Federal Facilities Agreement (FFA) signed	1995
Initiation of the remedial action for Site 2 - Area A Landfill soil	December 1996
Phase II RI completed	1997
First Five-Year Review Report completed	2001
Basewide Groundwater OU RI (BGOURI) completed	January 2002
BGOURI Update/Feasibility Study (FS) completed	July 2004
Final Operation and Maintenance Manual - Volumes I, II, III, IV, and V	January 2006

Investigations were initiated at NSB-NLON by the Navy Environmental Support Office (NESO) in 1979 to identify the source and extent of oil that was found in soils along the Thames River at three sites on the Lower Subase. NESO drilled and sampled 16 soil borings and piezometers. Envirodyne Engineers, Inc. completed an Initial Assessment Study (IAS) in 1982, as part of the NACIP program. The IAS recommended that various actions and studies be conducted at several sites for further characterization. A Phase I RI was completed in 1992 by Atlantic Environmental Services, Inc. for 11 sites.

Additional investigations, including but not limited to the Phase II RI (B&RE, 1997a), Lower Subase RI (TtNUS, 1999b), BGOURI (TtNUS, 2002a), BGOURI Update/Feasibility Study (TtNUS, 2004), and several Focused Feasibility Studies (FFSs), Feasibility Studies (FSs), and Engineering Evaluation/Cost Analyses (EE/CAs) have been completed to further evaluate sites at NSB-NLON. In addition, numerous decision documents have been signed and remedial actions completed for soil and groundwater at IRP sites at NSB-NLON. In 2006, the Operation and Maintenance (O&M) Manual for IR Program Sites at NSB-NLON was finalized. Additional information regarding the investigations, decision documents, and remedial actions is presented in Sections 2.0 through 22.0.

## 1.2.3 <u>Site Information</u>

This five-year review report addresses 21 of the 23 IRP sites at NSB-NLON undergoing investigation and remediation under CERCLA. Two sites (Site 1 – CBU Drum Storage Area and Site 4 – Rubble Fill at Bunker A-86) were not included in the second five-year review based on the recommendations of the First Five-Year Review Report which indicated reviews of these sites were not longer required. A No Further Action (NFA) decision document for soil was completed for Site 1 in July 1996. A NFA ROD for soil at Site 4 was completed in June 1998 after a removal action was completed in 1997. The sites included in the review and the rationale for including them are provided below. The operable units (OUs) associated with the sites and media are also provided.

The CERCLA remedial process continued through RODs for the following sites and media:

- Site 2 Area A Landfill soil (OU1)
- Site 3 Area A Downstream/Overbank Disposal Area (OBDA) soil and sediment (OU3) and groundwater (OU9)
- Site 6 Defense Reutilization and Marketing Office (DRMO) soil and groundwater (OU2)
- Site 7 Torpedo Shops soil (OU8) and groundwater (OU9)
- Site 8 Goss Cove Landfill soil (OU5)
- Site 14 Overbank Disposal Area Northeast (OBANE) soil (OU8) and groundwater (OU9)
- Site 15 Spent Acid Storage and Disposal Area (SASDA) soil (OU6) and groundwater (OU9)
- Site 16 Hospital Incinerators (OU11)
- Site 18 Solvent Storage Area Building 33 soil (OU11) and groundwater (OU9)
- Site 20 Area A Weapons Center soil (OU7) and groundwater (OU9)

RODs were completed for soil at Site 2 in September 1995, for soil and sediment at Site 3 in March 1998, for soil and groundwater at Site 6 in March 1998, and for soil and sediment at Site 8 in September 1999. A remedy of excavation and off-site disposal for Site 7 soil, as recommended in the OU8 ROD (2004),

was completed in 2006. A NFA ROD for soil at Site 15 was completed in September 1997. A final ROD recommending NFA for soil at Sites 16 and 18 was signed in 2004. A non-time-critical removal action at Site 14 and a remedial action at Site 20 were both completed in 2001. The soil ROD for OU8 recommended NFA for Site 14 soil (2004). In addition, the interim groundwater ROD for OU9 (2004) recommends NFA as the final remedy for groundwater at Sites 14, 15, 16, 18, and 20.

Five-year reviews were also conducted at the following sites. Removal actions or interim remedial actions (IRAs) have been completed at these sites, but all of the sites are still being evaluated under CERCLA.

- Site 9 Oil Tank (OT)-5
- Site 10 Fuel Storage Tanks and Tank 54-H (OU4)
- Site 11 Power Plant Oil Tanks (OU4)
- Site 13 Building 79 Waste Oil Pit (OU4)
- Site 17 Hazardous Materials/Solvent Storage Area Building 31 (OU4)
- Site 23 Tank Farm groundwater (OU9)

Five-year reviews were also conducted at the following sites. No removal actions or interim remedial actions have been conducted and no decision documents have been prepared for these sites. CERCLA investigation activities are ongoing at these sites.

- Site 2 Area A Wetland sediment (OU12)
- Site 19 Solvent Storage Area Building 316 (OU4)
- Site 21 Berth 16 (OU4)
- Site 22 Pier 33 (OU4)
- Site 24 Central Point Accumulation Area Building 174 (OU4)
- Site 25 Classified Material Incinerator (OU4)

#### 1.3 FIVE-YEAR REVIEW PROCESS

The NSB-NLON five-year review was led by Mark Evans, the Navy Remedial Project Manager. The following team members assisted in the review:

- Kymberlee Keckler, USEPA Region I Remedial Project Manager
- Mark Lewis, CTDEP Remedial Project Manager
- Richard Conant, NSB-NLON IRP Coordinator
- Corey Rich, TtNUS Project Manager (Navy CLEAN contractor)

- Robert Tess, ECC Project Manager (Navy O&M contractor)
- Greg Kemp, Gannett Fleming (USEPA Region I contractor)

The five-year review consisted of the following activities: a review of relevant documents, site inspections, and limited interviews. The final report will be placed in the Information Repositories and Administrative Record File for NSB-NLON. Most project documentation can be found at the following Information Repository locations:

- Groton Public Library (860) 441-6750
   52 Newtown Road, Groton, CT 06340
- Bill Library (860) 464-9912
   718 Colonel Ledyard Highway, Ledyard, CT 06399

Notice of the preparation of the Second Five-Year Review Report for NSB-NLON and a summary of the final Second Five-Year Review Report will be provided to the Restoration Advisory Board (RAB) at a future meeting (tentatively, March 2007). A notice of availability of the final Second Five-Year Review report will be provided to the public in the New London The Day newspaper. The notice will indicate that the Navy made available copies of the report in the Information Repositories listed above.

## 1.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND SITE-SPECIFIC ACTION LEVEL CHANGES

The second five-year review is being conducted for two purposes:

- To determine if the remedial actions are being implemented as specified in the RODs to protect human health and the environment.
- To determine if there have been changes in the ARARs or site-specific action levels that call into question the protectiveness of the remedy.

The chemical-specific ARARs that were identified in each of the RODs were reviewed, as were new federal and state regulations that have been promulgated. This section describes the overall impacts of the new or changed ARARs on the risk posed to human health or the environment. It was determined that recalculation of risk or risk assessments was not necessary to determine whether a remedy protects human health and the environment.

The human health risk assessments (HHRAs) for the sites were conducted primarily following the USEPA Human Health Evaluation Manual and supplemental documents (USEPA, 1989, 1991; 1992a) and USEPA Region I Risk Updates, Numbers 2, 3, 4, and 5 (USEPA 1994b; 1995b; 1996b; 1999b). Since the human health risk assessments were prepared USEPA has issued new guidance documents (USEPA, 2001b; 2002a; 2002b; 2004a; 2004b; 2005b; and 2005c). The new guidance documents do not impact the conclusions of the original human health risk assessments. Future HHRAs and five-year reviews will consider the most recent USEPA guidance. If updated carcinogenicity risk assessments become available, the Navy and regulators will determine whether an evaluation should be conducted as part of a future five-year review to assess whether adjustments to the target cleanup levels for remedial actions are needed in order for the remedies to remain protective of human health. If it is concluded that there are unacceptable risks, the target cleanup levels will be adjusted to address the risks so that the remedial actions are protective of human health.

The benchmarks used to select chemicals of potential concern (COPCs) for direct contact with soil and sediment included USEPA Region III Risk-Based Concentrations (RBCs), USEPA Region IX Preliminary Remedial Goals (PRGs), and Connecticut Remediation Standard Regulations (RSRs). In addition, USEPA Soil Screening Levels for the protection of migration from soil to groundwater and soil to air and Connecticut RSRs for pollutant mobility and volatilization from soil to indoor air were used to select COPCs for soil migration pathways. The USEPA Region III RBCs are usually updated twice a year and the USEPA Region IX PRGs are usually updated once a year. The CTDEP RSRs were issued in 1996 (CTDEP, 1996), additional RSRs were issued in 1999 (CTDEP, 1999b), and proposed revisions to the volatilization in criteria were issued in 2003 (CTDEP, 2003).

The benchmarks used to select COPCs for groundwater included USEPA Region III RBCs, USEPA Region IX PRGs, USEPA Maximum Contaminant Levels (MCLs), Connecticut MCLs, and CTDEP Groundwater Protection Criteria. In addition, CTDEP RSRs for surface water protection and migration from groundwater to indoor air were used to select COPCs for groundwater migration pathways.

The benchmarks used to select COPCs for surface water included USEPA Ambient Water Quality Criteria (AWQC) and Connecticut Water Quality Standards (WQSs). The USEPA AWQC were last updated in 2006 (USEPA, 2006), and the Connecticut WQSs were last updated in December 2002 (CTDEP, 2002).

Groundwater and surface water at Site 2 are being monitored to evaluate the effectiveness of the remedy for soil. The primary monitoring criteria for the Site 2 are the CTDEP SWPC. The SWPC were updated in April, 1999 (CTDEP, 1999) but the SWPC for the chemicals of concern (COCs) at Site 2 have not changed. The secondary monitoring criteria for Site 2 are the lower of the Federal AWQC and the Connecticut WQS. As noted above and discussed in Section 2 these criteria have been updated since

the final Groundwater Monitoring Plan for Site 2 was issued. The changes in the AWQC and WQS do not impact the protectiveness of the remedy for Site 2.

At Site 6 CTDEP WQSs published in 1992 were used as ARARs in the Interim and Final ROD. As discussed in Section 4 these ARARs have been updated since the Interim ROD for Site 6 was signed. The changes in the ARARs do not impact the effectiveness of the final selected remedy for Site 6.

A ROD has not been signed for groundwater at Site 8 although groundwater monitoring is being conducted to evaluate the effectiveness of the selected soil remedy. The groundwater monitoring criteria were based on site-specific SWPC developed in 1999 and CTDEP SWPC and volatilization criteria published in 1996 (CTDEP, 1999; CTDEP, 1996). As noted in Section 6 the site-specific SWPC were revised in January 2006.

At Sites 3, 7, 14, 15, 18, and 20 Federal MCLs and CTDEP drinking water/groundwater quality criteria were used as ARARs in the ROD. There have been no changes in the ARARs for these sites. However, the MCL for arsenic changed from 50 μg/L to 10 μg/L in January 2000 and EPA Region I issued new guidance for evaluating risks associated with manganese in November 1996. USEPA revised the oral reference dose for manganese in the IRIS database in May 1995. In November 1996 USEPA Region I issued guidance for evaluating exposures to manganese in soil and groundwater using the revised IRIS oral reference dose. The USEPA Region I guidance for manganese has been used in all human health risk assessments prepared for NSB-NLON since November 1996.

The ecological risk assessments for the sites were conducted primarily following USEPA Ecological Risk Assessment (ERA) guidance documents from 1992 (Framework for Ecological Risk Assessment) (USEPA, 1992b) and 1994 (Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Review Draft) (USEPA, 1994). The 1994 ERA guidance did not change significantly when it was updated in 1997 as an interim final document (USEPA, 1997). The risk assessments also re-evaluated some of the conservative assumptions used to obtain a "screening-level" risk, which corresponds to the Step 3a evaluation in the Navy Policy for Conducting Ecological Risk Assessments (Navy, 1999). Therefore, the risk assessment methodology has not changed significantly over the last five years.

At sites where food-chain modeling was conducted, exposure factors were obtained from the <u>Wildlife Exposure Factors Handbook</u> (USEPA, 1993b). This document is still the primary source for exposure factors in current ecological risk assessments. Also, many of the wildlife toxicity data were obtained from the Toxicological Benchmarks for Wildlife: 1994 Revision (Opresko et al., 1994). This document was updated in 1996 (Sample et al., 1996); however, many of the values did not change. Some of the

uncertainty factors that were applied to the toxicity data are currently not standard practice, but most of the uncertainty factors were removed when the less conservative exposure scenarios were presented. USEPA recently published Ecological Soil Screening Levels (Eco SSLs) for a few chemicals (USEPA, 2005). The Eco SSLs were developed for the following receptors; plants, invertebrates, mammals, and birds. Some of the exposure factors and toxicity data for mammals and birds in the Eco SSL document are different than those in the documents mentioned above but the differences are not expected to cause significant changes to the overall results of the risk assessments.

The benchmarks that were used to select ecological contaminants of concern (ECOCs) were obtained from different sources because there is no single document that contains criteria for all the chemicals that are typically detected in the media. The following paragraphs briefly discuss the primary sources of benchmarks that were used in the ERAs and whether or not they have been updated.

The primary source of surface water benchmarks was the Connecticut chronic WQSs. These criteria were last updated in December 2002 (CTDEP, 2002). Many of the WQSs are based on the USEPA AWQC, which were updated in 2006 (USEPA, 2006). Therefore, it is likely that the Connecticut WQSs will be updated in the future to reflect the changes in the USEPA AWQC. Other surface water benchmarks were based on the Ecotox Thresholds (USEPA, 1996a). Several of the values in the Ecotox Thresholds were updated (Suter and Tsao, 1996) since the publication of the Ecotox Thresholds. Toxicity data from the literature were used as benchmarks for chemicals that were not listed in the above documents.

The primary sources of sediment benchmarks were site-specific benchmarks that were based on equilibrium partitioning, using site-specific total organic carbon values, surface water benchmarks, and chemical-specific organic carbon partition coefficient (Koc) values. Because some of the surface water benchmarks were updated, some of the sediment benchmarks will change. Other sediment benchmarks that were used included the Effects Range-Low (ER-L) values (Long et al., 1995), the Sediment Quality Guidelines from the Ontario Ministry of Environment (OME, 1992), and the Washington State Freshwater Apparent Effects Thresholds (Washington State, 1994). The ER-L values have not been updated and are still being used as sediment benchmarks in current ERAs. The OME (OME, 1992) and Washington State (1994) documents were updated in 1993 (OME, 1993) and 1997 (Cubbage et al., 1997), respectively. Several of the values were revised in the updates.

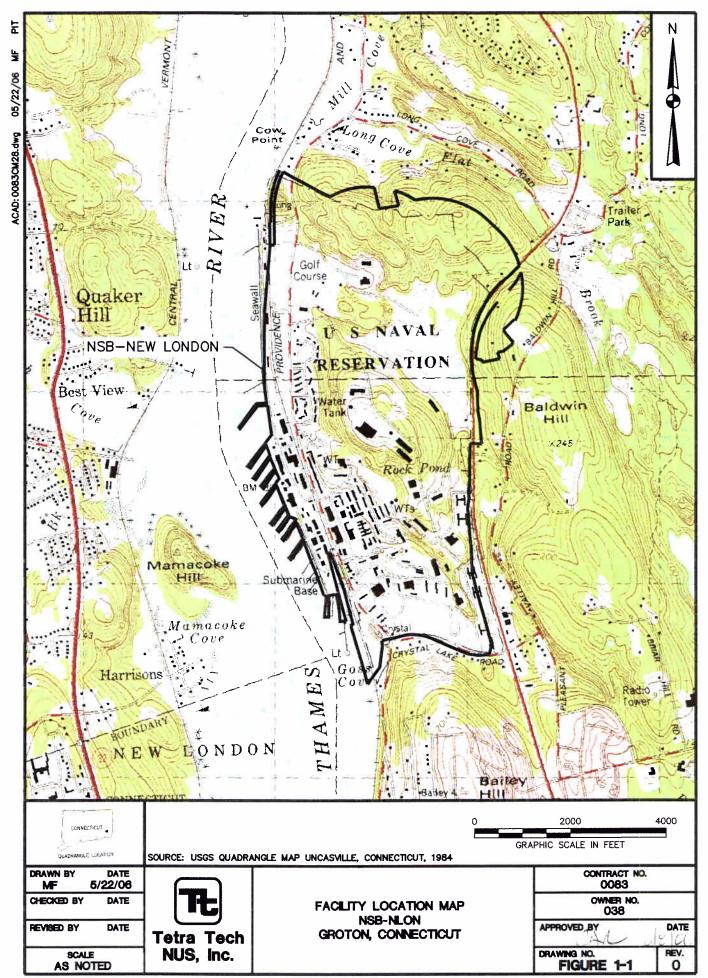
For soil, benchmarks for plants were primarily obtained from Will and Suter (1994), and benchmarks for soil invertebrates were primarily derived from ECOSAR (USEPA, 1994a). The Will and Suter document was updated by Efroymson et al., (1997a). Also, Efroymson et al., (1997b) developed a screening benchmark document for earthworms that is currently being used for soil benchmarks. The plant

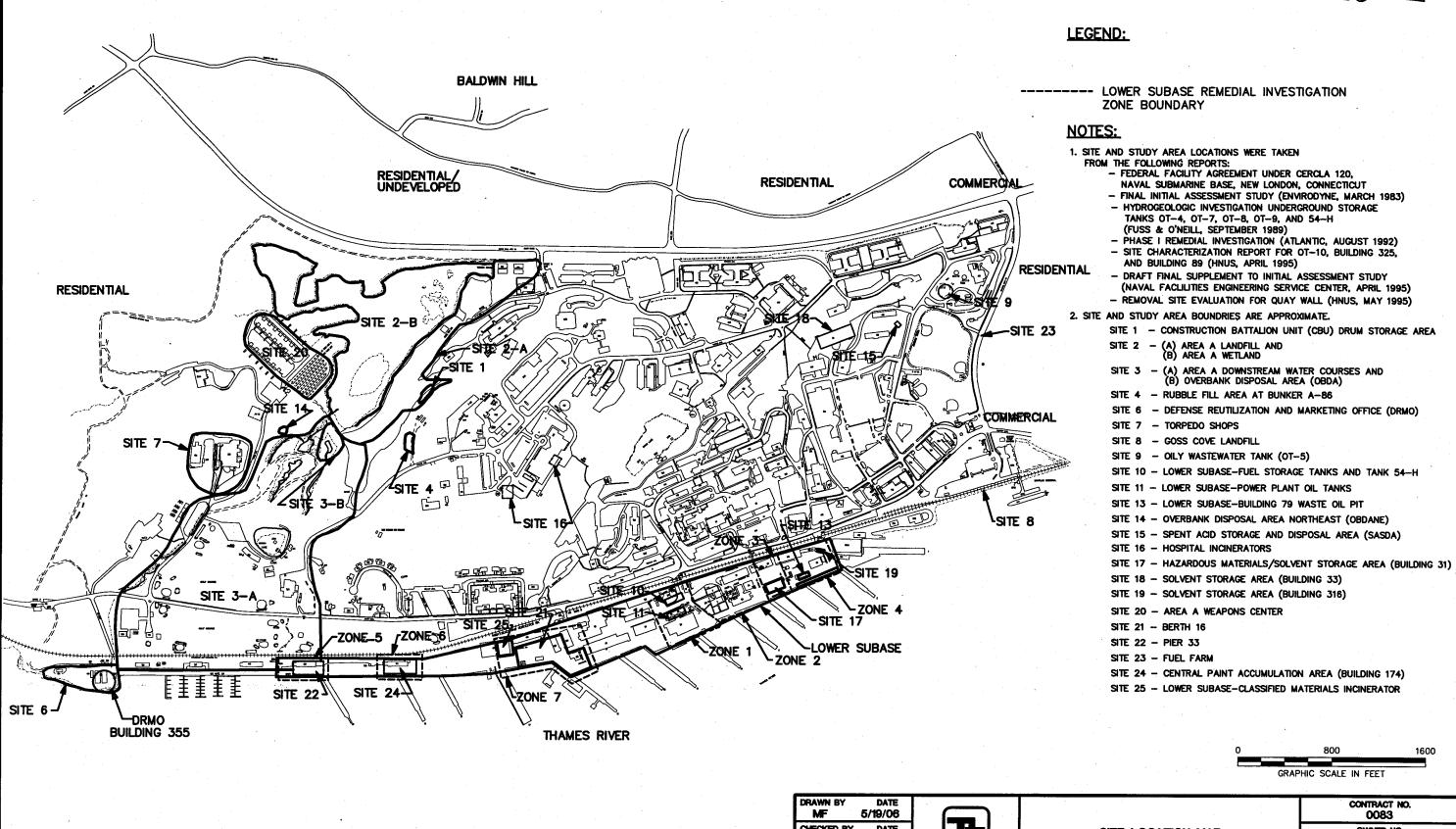
benchmarks in Efroymson et al. (1997a) are very similar to those in Will and Suter (1994). Efroymson et al. (1997b) has some earthworm benchmarks for chemicals that did not have values for ECOSAR. USEPA recently published Ecological Soil Screening Levels (Eco SSLs) for a few chemicals (USEPA, 2005). The Eco SSLs were developed for the following receptors; plants, invertebrates, mammals, and birds. In many cases, the plant and invertebrates values are similar to or greater than the plant and invertebrates benchmarks discussed above.

In general, most of the changes in the updated documents are not expected to significantly change the overall conclusions of the ERAs. Some of the benchmarks are lower in the updated documents, and some of the values are higher. Therefore, different chemicals may be retained as ECOCs during the screening if it was conducted at present. However, the decision to remediate a site is typically not based on screening benchmarks, because of the conservative nature of the benchmarks. A decision to remediate a site or decision on cleanup levels typically consists of other factors such as the collection of site-specific biological data (i.e., toxicity tests, biological surveys). The site-specific data would not be changed because of updates in the screening benchmarks.

#### 1.5 REPORT ORGANIZATION

This report has been organized with the intent of meeting the general format requirements specified in the Comprehensive Five-Year Review Guidance document (USEPA, 2001a), and summarizing the results of the five-year review for the 21 IRP sites in a cohesive and comprehensive manner. Section 1.0 gives an overview of NSB-NLON and five-year review process, as well as a discussion of changes in ARARs and site-specific action levels. Sections 2.0 through 22.0 summarize the five-year reviews conducted for each of the individual sites. Section 23.0 provides a general summary, conclusions, and protectiveness statement for NSB-NLON. This section also identifies when the next five-year review is required and the other tasks that should be performed as part of that five-year review. Five appendices are included in this report. Appendix A contains inspection report checklists completed for O&M activities. Appendix B contains photographs of the sites. Appendix C contains the five-year review inspection checklists. Appendix D contains the NSB-NLON Land Use Restriction Instruction [SOPA (ADMIN) New London Instruction 5090.18C (Navy, 2006)].





MF 5/19/06
CHECKED BY DATE

PEVISED BY DATE

SCALE
AS NOTED

Tetra Tech NUS, Inc.

SITE LOCATION MAP
NSB-NLON
GROTON, CONNECTICUT

CONTRACT NO. 0083

OWNER NO. 038

APPROVED BY GOOD DATE CAN GOOD PROVED DATE CONTRACT NO. PREV. DRAWING NO. PREV. O

BASE MAP SOURCE: PREPARED BY THE NAVAL SUBMARINE BASE PUBLIC WORKS DEPT.,

ENGINEERING DIVISION. MARCH 2006, DRAWING NO. A-667.

# 2.0 SITE 2 – AREA A LANDFILL (OU1 AND OU9) AND AREA A WETLAND (OU12)

Site 2 under the Navy's IRP includes the Area A Landfill and Area A Wetland. Both parts of Site 2 are addressed in this section; however, they are reviewed independently because decision documents and remedial actions are being completed independently.

This five-year review of the Area A Landfill portion of Site 2 is required by statute because hazardous substances, pollutants, or contaminants remain on site that do not allow for unlimited use or unrestricted exposure. A remedial action for the Area A Landfill soil OU (OU1) was completed in September 1997. The site has been monitored since the remedial action was completed to assess its effectiveness. As of this second 5-year review, the groundwater OU, a portion of OU9, has been monitored for 5 years and the landfill cap has been inspected annually for 3 years. Data collected during the monitoring and inspection programs are evaluated within this report.

No decision documents have been prepared for the Area A Wetland portion of Site 2. The sediment in the Area A Wetland was designated as OU12. This site is still being investigated under CERCLA. The need for remedial actions at the Area A Wetland will be determined in the future.

### 2.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 2 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

# **AREA A LANDFILL**

Event	Date
Landfill operations.	1957 to 1973
Final IAS completed.	March 1983
Verification Step 1A Study.	February 1988
Phase I RI completed.	August 1992
Remedial Design for OU1 began.	1994
Focused FS finalized.	May 1995
Proposed Plan for OU1 issued.	June 1995
Public Meeting for OU1.	June 1995
ROD for OU1 signed.	September 1995
Remedial Design for OU1 completed.	December 1996
Remedial Action for OU1 began.	December 1996
Phase II RI finalized.	March 1997
Remedial Action for OU1 completed.	September 1997

Event	Date
Final Report for Remedial Action at OU1 issued.	March 1998
Final Groundwater Monitoring Plan issued.	January 1999
Groundwater Monitoring Program initiated.	October 1999
Final Year 1 Groundwater Monitoring Report (GMR) issued.	May 2001
First Five-Year Review Report completed.	December 2001
BGOURI completed.	January 2002
Draft Final O&M Manual - Volumes I, III, IV, and V completed.	September 2002
Year 2 GMR for Area A Landfill issued.	December 2002
SOPA (ADMIN) New London Instruction 5090.18B issued.	February 2003
Draft O&M Manual - Volume II issued.	March 2003
Year 3 GMR issued.	July 2003
2003 Annual Landfill Inspection Report (LIR) issued.	November 2004
Year 4 GMR issued.	December 2004
2004 Annual LIR issued.	September 2005
Year 5 GMR issued.	August 2005
2005 Annual LIR issued.	October 2005
Final O&M Manual - Volumes I, II, III, IV, and V completed.	January 2006
SOPA (ADMIN) New London Instruction 5090.18C issued.	December 2006

# **AREA A WETLAND**

Event	Date
Wetland created with Thames River dredge spoils.	1950s
Phase I RI completed.	August 1992
Phase II RI completed.	March 1997
First Five-Year Review Report completed.	December 2001
BGOURI completed.	January 2002

# 2.2 BACKGROUND

# 2.2.1 Area A Landfill

The Area A Landfill is a relatively flat area bordered by a steep, wooded hillside that rises to the south, a steep wooded ravine to the west, and the Area A Wetland to the north. Figure 2-1 shows a site plan of the Area A Landfill. The location of Site 2 relative to other IR sites is shown on Figure 1-2.

According to the IAS Report (NEESA, 1983), the landfill opened sometime before 1957. However, a 1957 aerial photograph shows no apparent landfilling, which may indicate a somewhat later start-up date. All combustible materials generated by base operations that were not salvageable were incinerated, and the residues were disposed in the DRMO, Goss Cove, and Area A Landfills. The base incinerator, which was located in the Lower Subase along the waterfront at the present location of Building 478, ceased

operation in 1963. From 1963 to 1973, refuse and debris were disposed in the Area A Landfill. Landfilling operations ceased in 1973. The thickness of the landfill materials is estimated to range from 10 to 20 feet, based on test boring data.

The area fill method was reportedly used in landfill operations. New refuse was dumped along the face of previously deposited refuse and covered with earth. The cover material used on the landfill was sand and gravel obtained from the Groton water supply reservoir. After closure, a concrete pad was constructed in the southwestern portion of the landfill, adjacent to and northeast of Building 373, for above-ground storage of industrial wastes. Up to the time of the remedial action at the Area A Landfill, the pad was still in existence. In the early 1980s, 42 steel drums, 87 transformers [mineral oil and polychlorinated biphenyls (PCBs)], and 60 to 80 electrical switches were found to be stored on the pad. Two transformers and several electrical switches were reportedly leaking. Past leakage of oil was also evident. Most drums were stacked on wooden pallets, and those having PCB labels were covered and bound with plastic sheeting. All these materials were properly disposed off site.

The IAS Report indicated that refuse, including steel drums, oxygen candles, wood and metal scrap, concrete, and tires, was exposed at the edge of the landfill adjacent to the wetland. The IAS Report also stated that petroleum compounds had recently been poured from containers and had flowed into the Area A Wetland at two locations (northwestern portions of the landfill). According to the report, when batteries were overhauled, spent sulfuric acid solution was transferred to barrels and transported to the Area A Landfill for disposal. The acid was poured into trenches dug with a bulldozer and subsequently covered with soil. Based on records, established policy, and interviews, the potential for radioactive material having been disposed on site is considered to be effectively zero.

During a 1988 inspection of the site, iron floc was observed along the toe of the slope of the landfill, extending from the dike to the eastern end of the deployed parking lot. Iron floc occurs when groundwater with high concentrations of iron discharges to an oxygen-rich environment. Bacteria use the iron and oxygen to form the orange iron floc. The slope of the landfill had been covered with cover material, and the landfill material was not visible. Sand bags, salt, supplies, and equipment were stored on top of the landfill. Several transformers, underground storage tanks (USTs), crane weights, and other equipment were previously stored on the concrete pad in the southwestern portion of the landfill.

A two-phase RI was conducted to determine the nature and extent of contamination at the Area A Landfill. Phase I RI field activities were conducted from 1990 to 1992 (Atlantic, 1992). The Phase I RI of the Area A Landfill included test borings, monitoring well installation, and soil and groundwater sampling. Landfill materials encountered included glass, brick, wood, plastic, and ash intermixed with sand and gravel material used as cover. The Phase I RI concluded that risks associated with several exposure

scenarios exceeded acceptable regulatory levels and that a FS should be performed for the Area A Landfill site.

Phase II RI field activities were conducted from 1993 to 1995 (B&RE, 1997a). The Phase II RI of the Area A Landfill included test borings, monitoring well installation, and soil and groundwater sampling. The Phase II RI concluded that shallow groundwater contamination [i.e., volatile organic compounds (VOCs), PCBs, and inorganics] exists at the site, the landfill soil may pose a threat to human receptors due to concentrations of PCBs, and chemicals in soil could adversely impact ecological receptors. The Phase II RI recommended that, in addition to the installation of a landfill cover system, institutional controls including access/use restrictions and groundwater monitoring should be implemented at the site.

A low-permeability cover system was designed and installed on the Area A Landfill as the remedial action for soil at the site. Investigations were conducted to support the design of the cover system. Installation of the cover system was completed in September 1997. The CBU Drum Storage Area (Site 1) and the Rubble Fill Area at Bunker A-86 (Site 4) were also addressed during the remedial action at the Area A Landfill. The CBU Drum Storage Area (Site 1), formerly located within the boundary of the Area A Landfill, was capped at the same time as the landfill, and an NFA Decision Document was signed for Site 1. The Rubble Fill Area at Bunker A-86 (Site 4) was located along the southern boundary of the Area A Landfill. Construction debris and contaminated soil and sediment from the site were removed as part of a time-critical removal action and incorporated into the Area A Landfill subgrade. After the removal action, only exposed bedrock was left at the former Rubble Fill Area at Bunker A-86. An NFA Decision Document was also signed for this site. A majority of the Area A Landfill is paved and is currently used for storage of equipment and vehicles. Access by military personnel to most of the site is unrestricted.

The groundwater at the Area A Landfill is currently being monitored under a long-term groundwater monitoring program. The groundwater at the site was also investigated as part of the BGOURI. A final version of the BGOURI Report was issued in January 2002 (TtNUS, 2002a). The BGOURI recommended that the monitoring program be continued to gather data to evaluate long-term trends in contaminant concentrations and the decision to proceed to an FS should be made after sufficient data have been collected and evaluated.

#### 2.2.2 Area A Wetland

The Area A Wetland is located north of the Area A Landfill (see Figures 1-2 and 2-2). The location of the Area A Wetland was undeveloped, wooded land and possibly wetland until the late 1950s. In the late 1950s, dredge spoils from the Thames River were pumped to this area and contained within an earthen dike that extends from the Area A Landfill to the southern side of the Area A Weapons Center.

The Area A Wetland is underlain by dredge spoils that consist of silt and clay with traces of fine sand and shell fragments. The thickness of dredge spoils ranges from 25 to 35 feet on the southern side of the wetland, adjacent to the landfill, and from 10 to 15 feet on the northeastern side of the wetland. The total volume of dredged material in the wetlands is approximately 1.2 million cubic yards.

A small pond is located in the southern portion of the wetland, and between 1 and 3 feet of standing water is present in the pond during all seasons. Phragmites is the predominant type of vegetation. It was reported that pesticide "bricks" were placed on the ice in the wetland during winter and allowed to dissolve as a mosquito control measure. These "bricks" consisted of formulated (water-soluble) 1,1,1-trichloro-2,2-bis(4-chlorphenyl)ethane (4,4'-DDT) and were used in the 1960s, prior to the 1972 ban on 4,4'-DDT.

A two-phase RI was conducted to determine the nature and extent of contamination at the Area A Wetland. Phase I RI field activities were conducted from 1990 to 1992 (Atlantic, 1992). The Phase I RI of the Area A Wetland included test borings, monitoring well installation, and soil, sediment, and groundwater sampling. The Phase I RI concluded that risks associated with several exposure scenarios exceeded acceptable regulatory levels and that an FS should be performed for the Area A Wetland site.

Phase II RI field investigation activities were conducted from 1993 to 1995 (B&RE, 1997a). The Phase II RI of the Area A Wetland included test borings, monitoring well installation, and sediment, surface water, and groundwater sampling. The Phase II RI concluded that little surface water or groundwater contamination exists at the site, the site may pose a risk to a construction worker due to potential exposure to manganese in the groundwater, and significant pesticide, PCB, and polynuclear aromatic hydrocarbon (PAH) concentrations exist in site soil and sediments. The recommendations in the Phase II RI indicated that an FS should be conducted for this site that evaluates a limited action alternative including groundwater monitoring and access/use restrictions. The Area A Wetland sediment was subsequently identified as OU12 and the site is still be investigated under CERCLA.

# 2.3 REMEDIAL ACTIONS

Based on the results of the RI/FS process, it was determined that a remedial action was necessary for the Area A Landfill OU1. A ROD for OU1 was signed in September 1995 (Navy, 1995). The following sections describe the process used to select and implement the appropriate remedial action for OU1 at the Area A Landfill.

The groundwater OU for the Area A Landfill (a part of OU9) is still being investigated, and final recommendations for the OU will be determined when sufficient data are collected and evaluated.

The Area A Wetland (OU12) is still being investigated, and no remedial alternatives have been developed for the site; therefore, the Area A Wetland is not discussed in the following sections.

#### 2.3.1 Remedy Selection

An FFS for the Area A Landfill (Atlantic, 1995c) was completed in response to the recommendations of the Phase I and Phase II RIs. The FFS evaluated several remedial alternatives, and concluded that the off-site disposal and off-site incineration alternatives would provide superior protection of the environment, but that the capping alternative would be more cost effective than the incineration alternative. The capping alternative was selected as the preferred remedial alternative for OU1 at the Area A Landfill. The alternative was presented in the Proposed Plan in June 1995 and was formally selected in the ROD signed in September 1995.

Based on ARARs and risk assessment results, the following remedial action objectives (RAOs) were selected for OU1 at Area A Landfill:

- Protect potential human and ecological receptors from exposure to contaminated soil.
- Reduce contaminant migration from the site by preventing exposure of contaminated soils to wind
  and erosive elements and by preventing infiltration of rainwater through contaminated areas of the
  unsaturated zone.

To meet the RAOs, the selected remedy for the Area A Landfill, as defined in the ROD, consisted of the following components:

- Access Restrictions Access to contaminated areas of the site was to be limited via perimeter
  fencing and institutional controls. Access was to be limited to workers and other persons having
  business in these areas. The institutional controls would provide notice of hazardous materials at the
  site and ensure maintenance of cap integrity, worker protection, and other considerations.
- Site Grading and Stormwater Management As part of the cap installation process, the site was to be graded to promote runoff and prevent run-on. In addition, a groundwater interception system was to be installed to collect shallow groundwater flowing to the landfill and reroute it around the landfill to reduce groundwater contact with landfill contents/soils.
- Horizontal Barrier Cap Installation A low-permeability cap, covering approximately 13 acres, was to be installed over contaminated areas of the Area A Landfill. The components of the cap system were to vary depending on location. The final cover system in the plateau areas was to consist of the following components in ascending order: bedding/gas collection layer, geosynthetic clay liner and

geomembrane, drainage layer/subbase, woven geotextile, base course, and bituminous concrete surface course. The final cover system along the side slope areas was to consist of the following components in ascending order: bedding/gas collection layer, non-woven geotextile, cohesive backfill, textured geomembrane, drainage layer, non-woven geotextile, and riprap.

- Leachate Collection and Treatment A leachate collection system was to be considered to stabilize
  the cap and to further contain landfill wastes. The system was to isolate and collect leachate for
  treatment and/or disposal. A pre-design study was to be completed to determine the need for such a
  system and, if necessary, the type of system that would be required.
- Post-Closure Groundwater Monitoring The groundwater at the site was to be monitored after the
  installation of the cap system to assess the impacts of the cap system. The results were to be used
  to determine the need for groundwater remediation.

# 2.3.2 Remedy Implementation

The Remedial Design for OU1 began in 1994 and was completed for the Navy by two different contractors, Atlantic and Brown and Root Environmental (B&RE). Additional field work (i.e., field survey, geotechnical field investigation, and geotechnical laboratory testing program) was conducted to collect the data necessary to complete the design. An extensive groundwater modeling study was also completed to address design issues (i.e., leachate collection system, slope stability, etc.). The remedial design was completed in phases and was finalized in December 1996 (B&RE, 1996b).

The final cover system developed during the design included a majority of the components of the system included in the ROD. Minor modifications were made as a result of normal refinement of details during the design. The two most significant modifications were the following:

- No leachate collection system
- Increased protection at the toe of the side slope area

The decision for not including a leachate collection system was based on the results of the groundwater modeling study. For the design, the riprap layer at the toe of the side slope was replaced with a gabion basket system to provide increased resistance to shallow-based stability failures at the toe of slope and to prevent potential hydrostatic uplift on the low-permeability component of the side slope cap system. A comparison of the ROD and design cap components is provided below.

# **Plateau Areas**

#### Cap Components in ROD

#### Cap Components in Final Design

Bedding/gas collection layer	Granular bedding/gas management layer (12-inch-thick) and passive gas vent system
Geosynthetic clay liner and geomembrane	Geosynthetic clay liner and 40-mil low-density polyethylene (LDPE) geomembrane
Drainage layer/subbase	Granular drainage layer (12-inch-thick)
Woven geotextile	Woven geotextile
Base course	Base course (6-inch-thick)
Bituminous concrete surface course	Bituminous concrete (3-inch-thick)

# **Side Slope Areas**

#### Cap Components in ROD

# **Cap Components in Final Design**

Bedding/gas collection layer	Granular bedding/gas management layer     (12-inch thick) and passive gas vent system
Non-woven geotextile	Non-woven geotextile
Cohesive backfill	Cohesive backfill (6-inch thick)
Textured geomembrane	40-mil LDPE textured geomembrane
Drainage layer	Granular drainage layer (12-inch thick)
Non-woven geotextile	Non-woven geotextile
Riprap	Riprap (12-inch thick)/gabion basket system

The Navy's Remedial Action Contractor (RAC) mobilized to the site to begin preliminary construction activities in December 1996, and the remedial action was completed in September 1997. Details regarding the remedial action are summarized in the Final Remedial Action Report (B&RE, 1998c). The most significant change that occurred during the implementation of the remedial action was the inclusion of soil and debris excavated from Site 4 (OU10) under the cap. This change resulted in a 2.8-foot elevation increase in one area of the landfill that necessitated modifications to the cover system that was installed, primarily to the slopes of three drainage channels.

To ensure the quality of the remedial action, quality control testing and inspection were completed during the remedial action in accordance with the Construction Quality Control (CQC) Plan and the Material Quality Assurance (MQA)/Construction Quality Assurance (CQA) Plan. Two non-conformances were noted during quality control testing and inspection, but neither were regarded as significant enough to affect the performance of the cap system.

The cost estimate for implementation of the preferred remedial alternative was estimated at \$5,700,000 in the ROD. This estimate included costs associated with a groundwater collection and treatment system, cap O&M, and groundwater monitoring. A revised estimate was prepared during the remedial design that included only construction costs. The estimated cost for implementation of the remedial design was approximately \$4,500,000. This estimate did not include costs associated with a groundwater collection and treatment system, cap O&M, or groundwater monitoring. The actual final cost for implementation of the remedial design was approximately \$6,000,000. The major reason for the cost increase was the removal action that was completed at Site 4 (OU10) concurrent with the implementation of the OU1 remedial design.

To meet the land use control requirements in the ROD, the Navy prepared and implemented an instruction [SOPA (ADMIN) New London Instruction 5090.18 (Navy, 2000b)] to restrict use at IR sites at NSB-NLON. The instruction defined the Navy's policy regarding ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.

Other components of the remedial action, including long-term groundwater monitoring and O&M, are discussed in Section 2.3.3.

#### 2.3.3 System Operations/Operation and Maintenance

# 2.3.3.1 Monitoring Program

The Navy implemented a monitoring program for groundwater and surface water at the Area A Landfill in October 1999. The results of the program are being used to assess the effectiveness of the remedial action. Sampling was completed at the site in accordance with the final Groundwater Monitoring Plan for Area A Landfill (TtNUS, 1999a) from the initiation of the program through 2005. Future sampling activities at the site will be done in accordance with Volume II – Groundwater Monitoring Plan of the O&M Manual (TtNUS, 2006a).

Monitoring at the Area A Landfill was initially conducted quarterly, and then during Year 3, the monitoring frequency was reduced to semi-annually. Round 10 was the final quarterly sampling round, and Round 11 was the first semi-annual round. Groundwater and surface water samples collected under the original monitoring plan were analyzed for VOCs, semivolatile organic compounds (SVOCs), PAHs, PCBs, metals (total and dissolved), and water quality parameters [total organic carbon (TOC), chemical oxygen demand (COD), total dissolved solids (TDS), alkalinity, chloride, sulfate, and hardness]. Samples collected under the new monitoring program will be analyzed for SVOCs, PAHs, metals (total and dissolved), and water quality parameters [TDS, alkalinity, total suspended solids (TSS), and hardness].

Five annual reports (TtNUS, 2001b; TtNUS 2002f; TtNUS, 2003b; ECC, 2004e; and ECC, 2005f) have been issued that summarize the results of the monitoring program. The annual reports include a thorough evaluation of each year of data collected under the program. Numerous round-specific reports have also been prepared to document the results of the monitoring program. The round-specific reports provide a brief screening-level assessment of the sampling round data. All of the monitoring reports have been submitted to the USEPA and CTDEP for review and comment. The results of the monitoring program during this five-year review period are discussed in Section 2.5.2.1.

#### 2.3.3.2 Operation and Maintenance

The Navy issued a draft O&M Manual for the IR Program Sites at NSB-NLON, which included Area A Landfill, in September 2002 (TtNUS, 2002c). Volume III of the five-volume manual included site-specific instructions for O&M activities and an inspection checklist for the Area A Landfill. Due to an extended comment resolution period, O&M inspections of the Area A Landfill were conducted from 2003 through 2005 (3 years) in accordance with the draft O&M Manual. The O&M Manual was finalized in 2006 (TtNUS, 2006a), and it will provide the basis for future O&M activities at Area A Landfill.

The O&M process for the site includes annual inspections, reporting of results, and correcting any identified problems. The findings of the inspections are documented in the field on inspection checklists and then summarized in Annual LIRs (ECC, 2004b; ECC, 2005i; and ECC, 2005m). The inspections of the landfill focus on institutional controls, landscaping features, cap areas, stormwater features, and housekeeping and maintenance. Deficiencies noted during the inspections are addressed through the preparation of a Plan of Action and then executing the Plan of Action. Typically the inspections are conducted in the fall, and corrective actions are completed during the following summer. The results of three inspections conducted during this five-year review period are discussed in Section 2.5.2.2.

#### 2.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Area A Landfill. The recommendations from the First Five-Year Review Report are provided below along with the actions taken to address the recommendations.

Prepare and implement an O&M plan for the Area A Landfill to address the noted deficiencies.

A draft O&M Manual for the IR Program Sites at NSB-NLON, which included Area A Landfill, was issued on September 2002. Due to an extended comment resolution period, O&M activities were conducted from 2003 through 2005 (3 years) in accordance with the draft O&M Manual. The O&M Manual was finalized in 2006 and will provide the basis for future O&M activities at Area A Landfill.

- The deficiencies included lack of maintenance of vegetation, sediment, and asphalt cracks; improper storage of heavy equipment on the cap; lack of maintenance of monitoring wells; and lack of correction of a depression in the riprap along the toe of the landfill. The actions taken to address the deficiencies were as follows:
  - Unwanted vegetation in cracks, drainage channels, gabion baskets, and other areas on the landfill was addressed in August and September 2004 and July 2005. Herbicide was applied to some of the vegetation, and other vegetation was cut and removed.
  - Approximately 5,000 linear feet of cracks in the cap pavement were sealed with an asphalt sealant in December 2004. In July 2005, similar lengths of cracks were sealed, and holes in the pavement were filled with cold patch asphalt.
  - Sediment, vegetation, and debris were removed from the drainage channels in August and September 2004 and July 2005.
  - Limited progress has been made toward proper storage of heavy equipment on the cap. The Navy is considering various options to implement better housekeeping practices.
  - Limited maintenance has been performed on the monitoring wells that are part of the Groundwater Monitoring Program and located within the vicinity of the Area A Landfill. Routine maintenance has not been conducted on the monitoring wells at the Area A Landfill that are not included in the monitoring program.
  - No correction of the depression has been made. Subsequent inspections indicated that the stone and gabion systems appeared to be in good condition, and no mention was made of a depression in riprap.
  - Damaged fencing around the Deployed Parking Lot was repaired in October 2004.

Continue the Groundwater Monitoring Program, but optimize the sampling frequency and analytical parameter list. Determine the appropriate remedial action for the groundwater OU, if necessary, when sufficient data have been collected.

- By comparing the original Groundwater Monitoring Plan (TtNUS, 1999a) to the new plan included in Volume III of the O&M Manual (TtNUS, 2006a), the following steps have been taken to optimize the monitoring program at Area A Landfill:
  - The sampling frequency of the monitoring program has been reduced from quarterly to semiannually.
  - VOCs, PCBs, pesticides, and some water quality parameters (COD, sulfate, and TOC) have been removed from the analytical parameter list.
  - Surface water sampling at 6 of the 10 staff gauges (SG15, SG16, SG17, SG-18, SG-22, and SG-24) has been discontinued.
  - Groundwater sampling at 6 of the 16 monitoring wells (3MW12S, 2WMW38DS, 2WMW39DS, 2WMW41DS, 2WMW45DS, and 2WMW47DS) has been eliminated from the monitoring program.
  - An existing monitoring well (2LOW1D) that is completed in alluvium will be added to the program to better monitor potential contaminant migration from the site.
- A geochemical investigation was completed during Year 3 of the monitoring program to better
  understand the geochemistry of the local groundwater. The results indicated that the dredge spoils,
  and not the landfill waste material, significantly influence the geochemistry of the groundwater and
  concentrations of metals in groundwater downgradient (north) of the landfill.
- The BGOURI (TtNUS, 2002a), which included evaluation of the groundwater from the Area A Landfill, was completed. It was recommended that additional groundwater data be collected at the site under the monitoring program before a remedial action is selected for the groundwater OU.

#### Considering further restricting access to the site.

Signs were posted with the name and telephone number of the contact authority for persons
requesting access to the site. No additional restrictions on site access have occurred. Due to the
restrictive access to the base itself, it was determined that locking the gates at the landfill was not a
major concern.

# Continued enforcement of New London Instruction 5090.18.

- The instruction was updated to include the Goss Cove Landfill and was re-issued in 2003 (Instruction 5090.18B). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2 Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON.
- The instruction has been followed by personnel at NSB-NLON, and no significant disturbances of the soil or cap at the Area A Landfill have occurred.

Complete the RI/FS process for the Area A Wetland and determine the appropriate remedial action(s).

• No progress has been made in the RI/FS process for the Area A Wetland.

#### 2.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

# 2.5.1 Document Review

The documents reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

Final BGOURI	January 2002
Year 2 GMR for Area A Landfill	December 2002
Year 3 GMR for Area A Landfill	July 2003
2003 Annual LIR	November 2004
Year 4 GMR for Area A Landfill	December 2004
Year 5 GMR for Area A Landfill	August 2005
2004 Annual LIR	September 2005
2005 Annual LIR	October 2005
Final O&M Manual, Volumes I, II, and III	January 2006
SOPA (ADMIN) New London Instruction 5090.18C	December 2006

# 2.5.2 Data Review

# 2.5.2.1 Monitoring Data Review

Groundwater and surface water monitoring are being conducted as part of post-closure activities associated with Site 2 to evaluate the effectiveness of the remedial action. The monitoring program was designed to determine the following:

- The effectiveness of the remedial action in preventing the migration of COPCs at concentrations greater than the monitoring criteria to underlying groundwater and to surface water in nearby wetlands.
- The effectiveness of the remedial action in eliminating health risks.
- Whether the criteria used for evaluating the data have been met.
- Whether a groundwater plume exists and/or interferes with any existing use of groundwater.

The ultimate goal of the monitoring program is to show compliance with the selected monitoring criteria for those COPCs migrating or having the potential to migrate from the site. The criteria used to screen the data are a combination of CTDEP SWPC, federal AWQC, Connecticut WQSs, and background concentrations.

Data from Years 2 through 6 of the monitoring program are presented and evaluated in this Second Five-Year Review Report. The results of Year 1 of the program were presented in the First Five-Year Review Report (TtNUS, 2001). It should be noted that monitoring wells 3MW12S and 3MW12D were sampled during Year 1 but were destroyed during the remedial action at the Area A Downstream site. Well 3MW12D was replaced during Year 3 and was again sampled starting with Round 11.

# Year 2

Four quarterly rounds of sampling (Rounds 5, 6, 7, and 8) were conducted during 2000/2001 (Year 2). Figures 2-3 and 2-4 are tag maps that show groundwater and surface water data, respectively, that exceeded criteria during Year 2 of the monitoring program. The contaminants detected in groundwater in excess of criteria include benzo(a)pyrene, phenanthrene, arsenic, chromium, copper, lead, and zinc. The contaminants detected in surface water in excess of criteria include benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, phenanthrene, arsenic, and zinc.

PAHs were not detected in groundwater and surface water samples at concentrations greater than criteria during Year 1. The more frequent detection of PAHs in excess of criteria during Year 2 may reflect the impact of the asphalt pavement that was placed over the landfill.

A statistical evaluation of the groundwater data from Year 2 indicated an increase in arsenic concentrations when comparing data from upgradient and downgradient of the landfill. The evaluation also indicated that no temporal increase in arsenic concentrations was evident over the four sampling rounds. The results of the monitoring efforts indicated that there were limited exceedances of criteria, but overall no significant contaminant migration is occurring.

#### Year 3

Two quarterly rounds of sampling (Rounds 9 and 10) and one semi-annual round of sampling (Round 11) were conducted during 2001/2002 (Year 3). Figures 2-5 and 2-6 are tag maps that show groundwater and surface water data, respectively, that exceeded criteria during Year 3 of the monitoring program. The contaminants detected in groundwater in excess of the criteria include arsenic, cadmium, chromium, copper, and zinc. The contaminants detected in surface water in excess of criteria include phenanthrene, arsenic, copper, lead, and zinc. PAHs were not detected as frequently in groundwater and surface water samples at concentrations greater than criteria as during Year 2.

A statistical evaluation of the data from Year 3 indicated that total xylenes, bis(2ethylhexyl)phthalate (BEHP), arsenic, cadmium, chromium, copper, and zinc are present in downgradient groundwater at statistically greater concentrations than in upgradient groundwater. Further evaluation of the results (criteria comparisons and trend analysis) indicated that these contaminants do not pose any significant migration issues.

A geochemical investigation completed during Year 3 provided conclusive evidence that the slightly elevated arsenic concentrations detected in the downgradient monitoring wells in the Area A Wetland, which were completed in dredge spoils, are related to the dredge spoils and not the landfill. It is also likely that the elevated zinc levels are related to the dredge spoils as well as background conditions.

The geochemical investigation also indicated that the pore water in the dredge spoil is generally isolated from the local groundwater flow system. This conclusion was based on measured hydraulic conductivities (vertical and horizontal) and the observation that the dredge spoil pore water retains strong signatures of seawater. Therefore, the monitoring results do not indicate that the Area A Landfill is acting as a significant source of contamination to groundwater or surface water.

In addition, the annual statistical evaluations of the data indicated no temporal increase in arsenic concentrations over the sample rounds. Some of the other inorganics detected at elevated concentrations in downgradient dredge spoil wells are also probably related to the dredge spoils, but their concentrations are similar to background concentrations.

The results of the surface water/seep sampling efforts generally confirmed the groundwater monitoring results and indicated that no significant contaminant migration is occurring.

#### Year 4

Two semi-annual rounds of sampling (Rounds 12 and 13) were conducted during 2003 (Year 4). Figures 2-7 and 2-8 are tag maps that show groundwater and surface water data, respectively, that exceeded criteria during Year 4 of the monitoring program. The contaminants detected in groundwater in excess of criteria include phenanthrene, arsenic, copper, lead, and zinc. The contaminants detected in surface water in excess of criteria include benzo(b)fluoranthene, benzo(k)fluoranthene, phenanthrene, arsenic, chromium, copper, lead, and zinc.

A statistical evaluation of data from Year 4 indicated that benzo(a)anthracene, phenanthrene, arsenic, chromium, and lead had downgradient results that were statistically greater than upgradient concentrations. Further evaluation of the results (criteria comparisons and trend analysis) did not indicate that these contaminants pose any significant migration issues. Overall, the results of Year 4 monitoring indicated that the cap system was working properly and that significant contaminant migration from the site to surrounding areas was not occurring.

# Year 5

Two semi-annual rounds of sampling (Rounds 14 and 15) were conducted during 2004 (Year 5). Figures 2-9 and 2-10 are tag maps that show groundwater and surface water data, respectively, that exceeded criteria during Year 5 of the monitoring program. The contaminants detected in groundwater in excess of the criteria include arsenic, chromium, copper, lead, and zinc. The contaminants detected in surface water in excess of criteria include arsenic, cadmium, chromium, copper, lead, and zinc.

A statistical evaluation of the data from Year 5 indicated that chromium and copper had downgradient results that were statistically greater than upgradient concentrations. Further evaluation of the results (criteria comparisons and trend analysis) did not indicate that these contaminants pose any significant migration issues. The results of Year 5 are generally similar to the results of the first four years of groundwater monitoring, although detected concentrations and frequencies of detection were of a smaller magnitude. Overall the results of Year 5 monitoring indicated that the cap system was working properly and significant contaminant migration from the site to surrounding areas was not occurring.

#### Year 6

The final Year 6 monitoring report was not available at the time of preparation of this report. The results from the first of two semi-annual rounds of sampling (Rounds 16 and 17) conducted during 2005 (Year 6) were available. Figures 2-11 and 2-12 are tag maps that show Round 16 groundwater and surface water data, respectively, that exceeded criteria (ECC, 2006b). The contaminants detected in groundwater in excess of criteria include arsenic, chromium, and lead. The contaminants detected in surface water in excess of criteria include arsenic, cadmium, chromium, copper, lead, and zinc. No conclusions or recommendations were available for Year 6 of the monitoring program.

#### 2.5.2.2 O&M Data Review

Inspections are being conducted as part of post-closure O&M activities associated with Site 2. The goal of the inspections is to determine if appropriate O&M is being performed to maintain the effectiveness of the remedial action. As indicated in the table below, three inspections have been performed at Site 2 since the cap system was installed. All of the inspections were performed during the period being evaluated in this second five-year review. The findings of the annual inspections are summarized below.

Year	Date of Initial Inspection	Date of Supplemental Inspection	Final Report Date
2003	June 4, 2003	November 4, 2003	November 2004
2004	December 29,2004	April 26, 2005	September 2005
2005	October 11, 2005	NA	October 2005

NA – Not Applicable

#### 2003

A copy of the completed 2003 Inspection Checklist for Area A Landfill is provided in Appendix A. The inspection showed that the landfill was in generally good condition and was functioning as designed and meeting the long-term remedial objectives. However, the following housekeeping and maintenance deficiencies were noted during the inspection:

- Damaged fence sections at the Deployed Parking Area.
- Inadequate site security, including gates not closed and locked and signs that did not indicate contact authority (name and phone number).
- Vegetated/grass areas in the western and southern portions of the site were not stabilized.

- Significant cracking and separation of asphalt along paving lane joints.
- Vegetation and wind-blown trash present in the gabion system.
- Sediment, debris, and vegetation have accumulated in the drainage channels and culverts, causing
  obstruction of surface water flow.
- Equipment and materials are not properly stored on the landfill and have caused minor damage to the asphalt surface.
- Monitoring wells 2LMW20S, 2WMW44DS, 3MW37S, and 4MW1S have road boxes that do not fasten
  or have cracks in the surrounding concrete.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. Corrective actions were implemented to address the deficiencies, and these actions are discussed in Section 2.4. The corrective actions were implemented in August, September, and December of 2004. The extent of the corrective actions was limited to the level of funding available for the fiscal year.

# 2004

A copy of the completed 2004 Inspection Checklist for Area A Landfill is provided in Appendix A. The inspection showed that the landfill continues to be in generally good condition and was functioning as designed and meeting the long-term remedial objectives. However, similar to 2003, the following house keeping and maintenance deficiencies were noted during the inspection:

- Vegetation and grass in the western and southwestern portions of the site are encroaching on the asphalt cap.
- Significant cracking and separation of asphalt continue to be a problem along paving lane joints.
- Sediment, debris, and vegetation continue to accumulate and cause obstructions in the drainage channels and culverts.
- Equipment and materials are not properly stored on the landfill and have caused minor damage to the asphalt surface.

 Vehicles and heavy equipment stored on the cap are leaking fluids onto the cap, and there are no means for collecting or containing the leaks.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. Corrective actions were implemented in July 2005 to address most of the deficiencies, and these actions are discussed in Section 2.4. Similar to 2003, the extent of the corrective actions was limited by the level of funding available for the fiscal year.

#### 2005

A copy of the completed 2005 Inspection Checklist for Area A Landfill is provided in Appendix A. The inspection showed that the landfill was in generally good condition and was functioning as designed and meeting the long-term remedial objectives. However, the following housekeeping and maintenance deficiencies were noted during the inspection:

- Significant cracking and separation of asphalt continue to be a problem along paving lane joints.
- Bulges in the asphalt surface have appeared in the Deployed Parking Area.
- Sediment, debris, and vegetation continue to accumulate and cause obstructions in the drainage channels and culverts (Drainage Channels A, B, C, and D).
- Equipment and materials continue to be improperly stored on the landfill and cause minor damage to the asphalt surface.
- Several of the monitoring wells have sediment and vegetation on them. Others are missing covers and are exposed to the elements.
- Gas vents do not have screens to restrict animal habitation.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. It is expected that the corrective actions will be implemented during the summer of 2006.

#### 2.5.3 ARAR and Site-Specific Action Level Changes

The remedial action implemented for soil at the Area A Landfill includes an engineered cap system, land use controls, groundwater monitoring, and O&M. ARARs and TBCs were reviewed to determine whether there have been changes since the Remedial Design Report and final Groundwater Monitoring Plan were

issued. Listings of chemical-specific, location-specific, and action-specific ARARs, advisories and guidance (TBCs) that were considered in the ROD are listed in Tables 2-1, 2-2, and 2-3, respectively. With the exception of monitoring criteria, the ARARs have not been amended since the Remedial Design and final Groundwater Monitoring Plan. Changes associated with monitoring are addressed in the response to Question 2 of Section 2.6.

The ERA for the Area A Landfill indicated that chemicals detected in surface soil present a potential risk to ecological receptors. The site was subsequently capped, which eliminated the exposure pathway. Therefore, any changes in the screening values since the completion of the ERA would not impact the effectiveness of the remedial action.

#### 2.5.4 <u>Site Inspection</u>

The Area A Landfill was inspected on April 4, 2006. The focus of the inspection was on the engineered cap system installed over the landfill. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, Environmental Chemical Corporation (ECC), and Gannett Fleming participated in the inspection. Photographs taken of site features during the inspection are provided in Appendix B. The site inspection checklist completed during the inspection is provided in Appendix C.

The site inspection included visual observations of the current condition of the engineered landfill cap system at Site 2. During the site inspection, the team found that the land use for the site has remained unchanged since the remedial action and first five-year review were completed. The Navy has continued to use the area for equipment storage and vehicle parking. Signs were observed during the inspection at the entrances to the site, warning that access is only for authorized users and that personnel should not dig at the site. In general, the site inspection found that the cap system was working as intended. However, even though the Navy has implemented an O&M program for Site 2 and corrective actions have been taken, a number of items were identified during the site inspection that if not addressed, could negatively affect the long-term performance of the cap system. These items are noted in the site inspection checklist provided in Appendix C and on Figure 2-1. The items and their potential long-term impacts on the cap system are as follows:

- Vegetation continues to grow along the edge of the asphalt covering the plateau, in cracks in the asphalt, and in the riprap covering the sideslopes. The root systems of the vegetation could penetrate the cap system.
- Sediment, debris, and vegetation (*Phragmites*) clog portions of the drainage channels (i.e., A, B, C, and D). The affected portions of the channels are shown on Figure 2-1. If the sediment and debris

are not removed, it may result in surface water overtopping the channels and flowing across the cap system. Continued *Phragmites* growth may result in the root system penetrating the cap because the roots can penetrate up to 2 meters.

- Two catch basins near the gate at Thresher Avenue are completely blocked with silt and debris. Surface water runoff typically collected by these catch basins is flowing across the landfill and discharging into Channel C. It appears that the off-site runoff is contributing to the debris buildup in Channel C. These catch basins should be cleaned out to minimize any further impacts to Channel C.
- Heavy equipment continues to be improperly stored on the cap, resulting in minor damage to the
  asphalt. The damage mainly consists of holes/penetrations in the asphalt that may allow surface
  water to enter the cap drainage layer. This could result in further deterioration of the asphalt during
  freeze-thaw cycles and underlying cap components.
- Stored items (e.g., concrete barriers, treated timbers, etc.) are blocking access to some of the
  monitoring wells. The wells cannot be inspected, maintained, or used for the groundwater monitoring
  program. Barriers should be placed around the monitoring wells to maintain access to them and to
  restrict storage of items on top of them.
- Longitudinal cracks continue to form in the asphalt. Several of the cracks fully penetrate the asphalt.
   Many of the cracks have been sealed, but if the new cracks are not sealed, surface water will penetrate the asphalt and further deteriorate the asphalt during freeze-thaw cycles.
- Monitoring wells that are not part of the groundwater monitoring program have not been maintained
  or properly abandoned. Two monitoring wells (2LMW8S and 2LMW20D) were found to be
  unprotected (i.e., no protective cover or j-plug), providing a direct conduit to the groundwater aquifer
  beneath the site.
- The small depression discovered in the riprap along the toe of the landfill at the northwestern corner during the first five-year review was still evident during the second five-year review. The area is shown on Figure 2-1. It appears that surface water runoff is channeled through this area, which may be causing erosion of material underlying the riprap. If the situation is not addressed, the long-term impact could be that the cap system is impacted in this location.
- Debris (e.g., concrete rubble and furniture) has been dumped on the site. The site was not intended
  to be used for waste disposal. It is unlikely that the debris will impact the functionality of the cap

system, but it should be removed and disposed at an approved off-site disposal facility (i.e., municipal landfill).

• The gas vents do not have screens. The screens will prevent habitation of animals in the vents and prevent unwanted material (e.g., trash) from being deposited in them.

# 2.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second 5-year review. Relevant discussions with the inspection team regarding the site are documented on the site inspection checklist (see Appendix C).

#### 2.6 ASSESSMENT

The following conclusions support the determination that the remedy for the Area A Landfill OU1 is currently protective of human health and the environment.

### Question 1. Is the remedy functioning as intended by the decision documents?

- Remedial Action Performance: The engineered landfill cap system installed at the Area A Landfill is currently effective in limiting direct exposure to contaminated soil and minimizing contaminant migration from the site. A monitoring program is being conducted to evaluate the cap's performance regarding minimizing contaminant migration. The data do not indicate any significant contaminant migration concerns. If future groundwater data indicate the need to evaluate additional remedial actions, the Navy will perform the evaluation at that time. O&M of the cap began in 2003, and annual maintenance is being performed to maintain proper long-term performance of the cap system.
- System Operations/O&M: Installation of the engineered cap system was completed in September 1997. An O&M Manual was developed and implemented in 2003. The cap system is still functioning as intended, and O&M of the cap system is being performed annually at the site. The items noted in Section 2.5.4 should be addressed to improve the O&M of the site.

Actual costs for the monitoring program have ranged from approximately \$133,000 per year to \$245,000 per year (see table below). Costs have generally decreased due to optimization of the monitoring program. The costs include the costs associated with sampling, analysis, validation, and reporting. Costs associated with preparing and updating the Groundwater Monitoring Plan and maintaining the groundwater monitoring wells are not included in the costs.

Source	Cost of Monitoring
Projected Annual Cost in ROD	\$125,000
Actual Year 1 Cost (1999/2000)	\$210,000
Actual Year 2 Cost (2000/2001)	\$245,000
Actual Year 3 Cost (2001/2002)	\$200,000
Actual Year 4 Cost (2002/2003)	\$133,000
Actual Year 5 Cost (2003/2004)	\$138,000
Actual Year 6 Cost (2004/2005)	\$151,000

The cost for annual O&M estimated during preparation of the ROD was \$11,100. O&M of the cap system began in 2003, and costs have ranged from approximately \$14,600 per year to \$83,800 per year (see table below). Costs have fluctuated due to the amount of maintenance required and the amount of funding available. The annual O&M costs include the costs for landfill inspections, reporting, and maintenance.

Source	Cost of O&M
Projected Annual Cost in ROD	\$11,100
Actual Year 1 Cost (2003)	\$14,600
Actual Year 2 Cost (2004)	\$83,800
Actual Year 3 Cost (2005)	\$53,700

- Opportunities for Optimization: The sampling frequency of the monitoring program was reduced
  from quarterly to semi-annually. The monitoring frequency should be further reduced to annually.
  VOCs, pesticides, PCBs, and water quality parameters (TOC, sulfates, and COD) were eliminated
  from the analytical parameter list. Six monitoring wells and six surface water sampling locations were
  eliminated from the monitoring program.
- **Early Indicators of Potential Issues:** There were deficiencies noted during the O&M inspections of the cap system. Currently, the deficiencies do not compromise the protectiveness of the remedy, but if they are left unaddressed, they could result in remedy failure in the future.
- Implementation of Institutional Controls and Other Measures: Institutional controls associated
  with the Area A Landfill are being implemented in accordance with New London Instruction 5090.18C.
  Fencing is in place around the site, and signs are posted at the entrances of Site 2 warning that
  access is only for authorized users and that a cap is in place and no digging is allowed. These
  controls meet the intent of the access restriction RAO.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

• Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the ROD were reviewed to determine changes since the Remedial Design and final Groundwater Monitoring Plan were issued. As presented in Section 2.5.3, there have been no changes to currently relevant ARARs with the exception of monitoring criteria.

In the first Groundwater Monitoring Plan for the Area A Landfill (TtNUS, 1999a), Connecticut SWPC were identified as the primary monitoring criteria for the Area A Landfill and the lesser of the federal AWQC and the Connecticut WQSs were identified as the secondary criteria. The monitoring plan and criteria for the Area A Landfill were recently updated during finalization of the O&M Manual (TtNUS, 2006a). The following changes were noted between the plans:

- Pesticides and PCBs were eliminated from the monitoring program in the new plan because the monitoring data showed that these contaminants were not detected during the first 10 rounds of monitoring. VOCs were eliminated from the monitoring program because the monitoring data showed that these contaminants were not detected or not present at significant concentrations.
- The SWPC for phenanthrene (0.077 μg/L) in the 1996 CTDEP RSRs was found to be incorrect and was updated to 0.3 μg/L. This correction was confirmed with the CTDEP. None of the other SWPC for the COCs at the Area A Landfill have changed.
- The Connecticut WQSs were updated in December 2002. The federal AWQC were updated in 2006, but it was determined that only the Connecticut WQSs should be used for the site into the future.
- A comparison of the old and new criteria is presented in Table 2-4.

The changes in criteria do not impact the protectiveness of the remedy.

- Changes in Exposure Pathways: There have been no changes at the site that would have resulted in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in the human health toxicity criteria that will impact the primary or secondary monitoring criteria.

- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in human health risk assessment methodology since the signing of the ROD that will impact the protectiveness of the remedy.
- Expected Progress Towards Meeting RAOs: The RAOs for OU1 were met by installing and
  maintaining the engineered cap system and conducting groundwater monitoring. RAOs for the
  groundwater at the Area A Landfill, a portion of OU9, will be defined in the future.

# Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

#### 2.7 ISSUES

Several O&M deficiencies were noted during the five-year review site inspection that should be resolved. The deficiencies are presented in Sections 2.5.4 and summarized in Table 2-5.

# 2.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and review, the following recommendations are made for Site 2:

- Continue O&M of the site and address the O&M deficiencies noted in Sections 2.5.4 and 2.6.
- Install screens on every gas vent and add an additional jersey barrier for gas vents GVR-1 and GVR-11.
- Continue the monitoring program, but reduce sampling frequency to annually and further optimize the
  analytical parameter list, as appropriate. Develop and implement a well abandonment program to
  eliminate wells that are no longer required for the monitoring program. The wells that should be
  abandoned at Site 2 include 2LMW8S, 2LMW18S, 2LMW18D, 2LMW20D, and 2LMW34DS.
- Develop and implement an equipment storage plan that would organize storage, provide safe methods for storage of equipment on the cap, and eliminate storage of equipment on top of active monitoring wells.

- Select an appropriate remedial action for the groundwater OU and document the remedy in a Proposed Plan and ROD.
- Continue enforcement of New London Instruction 5090.18C. Continue control of the site by Command Masters at Arms, but consider further restricting access to the site to eliminate dumping of waste on the site.
- Complete the RI/FS process for the Area A Wetland and determine the appropriate remedial action(s).
- At least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews.
- Amend O&M Manual to remove federal AWQC.

Follow-up actions should be completed by the Navy in a timely manner to address the recommendations.

#### 2.9 PROTECTIVENESS STATEMENT

The remedy at the Area A Landfill is currently protective of human health and the environment. The source of contamination is contained. The engineered cap system minimizes infiltration and subsequent contaminant migration and prevents direct contact with soil. A monitoring program is being implemented to verify that the cap is performing as designed, and the results of the program suggest that the cap is performing as planned. Continued implementation of land use controls and O&M will maintain the effectiveness of the remedy into the future.

A protectiveness determination for the Area A Wetland cannot be made at this time because no remedy has been implemented. When a remedy has been selected and implemented for the Area A Wetland, its protectiveness will be determined.

# CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
FEDERAL				
USEPA Human Health Assessment Cancer Slope Factors (CSFs)	NA	TBC	CSFs are guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure.
USEPA Reference Dose (RfDs)	NA	TBC	RfDs are guidance values use to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure.
STATE OF CONNECTICU	т			
Cleanup Standard Regulations	CGS §22a- 133k (Updated to RCSA Section 22a-133k-1 through 3)	TBC	These regulations provide specific numeric cleanup criteria for a wide variety of contaminants in soil and groundwater. Separate criteria are established for threats to human health and environmental receptors posed by direct contact with contaminants.	These were replaced by the CTDEP RSRs. The selected remedy complies with these standards because of employment of the engineered control. Changes in action levels for groundwater are addressed on Table 2-4.
Water Pollution Control	RCSA § 22a- 430-1 through 8	Applicable	These rules establish permitting requirements and criteria for water discharge to surface water.	This regulation was addressed during construction. Now that the cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.

# CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
STATE OF CONNECTICU	T (Continued)			
Water Quality Standards	CGS 22a-426	Applicable	Connecticut's WQSs establish specific numeric criteria, designated uses, and anti-degradation policies for groundwater and surface water.	Standards are being used to evaluate monitoring results to determine if further remedial action is required to protect resources. Remedial activities were undertaken in a manner that was consistent with the antidegradation policy in the WQSs. Changes in groundwater quality criteria are addressed in Table 2-4.

NA - Not Applicable.

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
FEDERAL				
Executive Order (E.O.) on Protection of Wetlands	E. O. 11990, 40 CFR Part 6, App. A	Applicable	Requires federal agencies to avoid impacts associated with the destruction or loss or wetlands, minimize potential harm, preserve and enhance wetlands, and avoid support of new construction in wetlands if a practicable alternative exists.	The cap was designed to minimize impacts to the adjacent wetlands. Now that cap construction has beer completed, these requirements are applicable to future operation and maintenance of the remedy.
Clean Water Act §404 – Dredge and Fill Activities	40 CFR Parts 230; 33 CFR Parts 320-328	Applicable	Requires that for dredging or filling of wetlands: no practicable alternatives exist, the activity will not cause a violation of state water quality standards or significant degradation of the water, and adverse effects will be minimized.	The landfill cap was designed to meet these standards and minimize the impacts to adjacent wetlands. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
STATE OF CONNECTICUT	-			
Inland Wetlands and Watercourses Regulations	RCSA §§22a-39- 1 through 15	Applicable	Regulates any operation within or use of a wetland or watercourse involving removal or deposition of material, or any obstruction, construction, alteration, or pollution of such wetland or watercourse.	The landfill cap was designed to meet these standards and minimize the impacts to adjacent wetlands. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
Inland Wetlands and Watercourses Regulations	CGS §§22a-45a	TBC	Governs minor activities including installation of water quality monitoring equipment such as water quality testing devices, and survey activities including test pits and core sampling. The CTDEP was drafting these requirements during preparation of the FFS.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
FEDERAL				
RCRA – General Requirements	40 CFR Part 264 Subpart A	Relevant and Appropriate	Established general requirements for owners and operators of hazardous waste treatment, storage, and disposal facilities.	The cap and associated systems were designed to meet these requirements. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
RCRA – Preparedness and Prevention	40 CFR Part 264 Subpart C	Relevant and Appropriate	Established requirements for minimizing the possibility of fire, explosion, or release of hazardous material.	The cap and associated systems were designed and remedial action was carried out to meet these requirements. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
RCRA – Contingency Plan and Emergency Procedures	40 CFR Part 264 Subpart D	Relevant and Appropriate	Established contingency plan requirements on the event of fire, explosion, or release from a facility.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability		
FEDERAL (Conti	FEDERAL (Continued)					
RCRA – Releases from Solid Waste Management Units	40 CFR Part 264 Subpart F	Relevant and Appropriate	Regulates releases from Solid Waste Management Units (SWMUs).	This regulation was addressed during construction. Now that cap construction has been completed, possible releases are being addressed by groundwater monitoring. Section 264.99 specified a sequence of at least four samples from each well collected at least semi-annually during the compliance period, and Section 264.96 specified a compliance period of demonstrating groundwater protection for a period of three consecutive years beyond closure. Groundwater and surface water sampling continue at the site based on the requirements specified in the Groundwater Monitoring Plan.		
RCRA – Closure and Post- Closure Requirements	40 CFR Part 264 Subpart G	Relevant and Appropriate	Establishes general requirements for closure and post-closure of hazardous waste landfills.	The cap and associated systems were designed to meet these requirements. Post-closure groundwater monitoring is addressed under Subpart F.		
Federal Clean Air Act – National Emission Standard for Hazardous Air Pollutants (NESHAPS)	40 CFR Part 61	Relevant and Appropriate	Establishes emission levels for eight listed hazardous air pollutants emitted from particular types of facilities.	This act was considered during the selection of the remedy. The selected remedy included passive gas management but no sampling; therefore this requirement is no longer applicable.		

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 3 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability		
FEDERAL (Conti	FEDERAL (Continued)					
Federal Clean Air Act – Non- methane Organic Compounds (NMOCs)	Proposed Rule – 56 FR 24468, to be codified at 40 CFR Part 60 Subpart WWW.	TBC	Regulations would require specific gas collection and control systems, monitoring, and gas generation estimates. The proposed rule would establish a performance standard for NMOC emissions from municipal and solid waste landfills.	This act was considered during the selection of the remedy. The selected remedy included passive gas management but no sampling; therefore this requirement is no longer applicable.		
Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES)	40 CFR 122 through 125, 131	Applicable	NPDES (National Pollution Discharge Elimination System) permits are required for any discharges to navigable waters. If remedial activities include such a discharge, the NPDES standards would be ARARs.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.		
PCB Regulation under TSCA	40 Part CFR 761	Applicable	These standards govern the storage of PCB items.	PCB contamination was addressed by capping the site, although any changes to the cap in the future would require revisiting this issue.		
EPA Technical Guidance – Final Covers on Hazardous Waste Landfills and Surface Impoundments	EPA/530-SW-89-047	TBC	Presents technical specifications for the design of multi-layer covers at landfills where hazardous wastes were disposed.	The cap and associated systems were designed to meet these requirements. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.		

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 4 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability		
STATE OF CON	STATE OF CONNECTICUT					
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a-449(c) 100-101	Applicable	These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR Parts 260 and 261 are incorporated by reference.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.		
Hazardous Waste Management: Generator Standards	RCSA § 22a-449(c)- 102	Applicable	This section establishes standards for various classes of generators. The standards of 40 CFR Part 262 are incorporated by reference. Storage requirements in 40 CFR Part 265.15 are also included.	Any hazardous wastes generated during the remedial action were managed in accordance with the substantive requirements of these regulations. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.		
Hazardous Waste Management: TSDF Standards	RCSA § 22a-449(c)- 104	Relevant and Appropriate	This section establishes standards for treatment, storage, and disposal or hazardous waste, and establishes standards for closure, post-closure, and groundwater monitoring. The standards or 40 CFR Part 364 are incorporated by reference.	The remedial action does not include any on-site treatment, storage, or disposal of hazardous waste. The proposed cap design complied with the closure requirements of this regulation. The remedial action includes groundwater monitoring. This regulation was last amended in 1994; therefore, compliance with this regulation is current.		

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 5 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability	
STATE OF CONNECTICUT (Continued)					
Hazardous Waste Management: Interim Status Facilities and Groundwater Monitoring Requirements, Closure and Post-Closure Requirements	RCSA §§ 22a-449(c)- 105	Relevant and Appropriate	This section establishes interim status standards for treatment, storage, and disposal or hazardous waste, and establishes standards for closure, post-closure, and groundwater monitoring. The standards or 40 CFR Part 364 are incorporated by reference.	The proposed cap design complied with the closure requirements of this regulation. The remedial action includes groundwater monitoring. This regulation was last amended in 1994; therefore, compliance with this regulation is current.	
Solid Waste Management	RCSA 22a-209-1 through 15	Applicable	Establishes standards for closure of solid waste disposal areas	Those portions of the regulations that are more stringent than federal RCRA Subtitle D regulations were met. This regulation was last amended in 1996; therefore, compliance with this regulation is current.	
Transportation of Oil and Chemical Liquids	RCSA 29-337-1 through 3	Applicable	These rules govern the transportation of hazardous materials, including flammable liquids and other chemicals.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Control of Noise	RCSA 22a-69-1 through 7.4	Applicable	These regulations establish allowable noise levels.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	

# **TABLE 2-3**

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 6 OF 6

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
STATE OF CONN	IECTICUT (Continued)			
Air Pollution Control – Organic Compound Emissions, Odors, Hazardous Air Pollutants, Particulate Emissions, Stationary Sources, Sulfur Compound	RCSA § 22a-174-1 through 29	Applicable	These regulations require permits to construct and operate specified types of emission sources and contain emission standards that must be met prior to issuance of a permit. Pollutant abatement controls may be required. Specific standards pertain to fugitive dust (18b) and control of odors (23).	The remedial action activities were implemented following the requirements of this regulation. The selected remedy included passive gas management but no sampling; therefore, this requirement is no longer applicable.

**Emissions** 

TABLE 2-4

# COMPARISON OF MONITORING CRITERIA SITE 2 - AREA A LANDFILL OU9 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

	CTDEP	SWPC <sup>(1)</sup>	CTDEP WQSs <sup>(2)</sup>		
Chemical	1999 <sup>(3)</sup>	2006 <sup>(4)</sup>	April 1996	December 2002	
VOCs (ug/L)					
1,1,2,2-TETRACHLOROETHANE	110		NA		
ETHYLBENZENE	580000		NA		
XYLENES, TOTAL	NA		NA		
SVOCs (ug/L)					
BENZO(A)ANTHRACENE	0.3	0.3	NA	NA	
BENZO(A)PYRENE	0.3	0.3	NA	NA	
BENZO(B)FLUORANTHENE	0.3	0.3	NA	NA	
BENZO(K)FLUORANTHENE	0.3	0.3	NA	NA	
BIS(2-ETHYLHEXYL)PHTHALATE	59	59	NA	NA	
PHENANTHRENE	0.077	0.3	NA	NA	
Pesticides/PCBs (ug/L)					
AROCLOR-1016	0.5		0.014		
AROCLOR-1254	0.5		0.014		
AROCLOR-1260	0.5		0.014		
DIELDRIN	0.1		0.0019		
HEPTACHLOR	0.05		0.0038		
Inorganics (total/dissolved) (ug/L)					
ARSENIC	4	4	190	150	
BERYLLIUM	4	4	NA	NA	
CADMIUM	6	6	0.62	1.35	
CHROMIUM <sup>(2)</sup>	1,200/110 <sup>(5)</sup>	110 <sup>(6)</sup>	10	11	
COPPER	48	48	4.8	4.8	
LEAD	13	13	1.3	1.2	
ZINC	123	123	12.3	65	

- 1 CTDEP Surface Water Protection Criteria from Connecticut RSRs (1996).
- 2 CTDEP Water Quality Standards.
- 3 Area A Landfill Groundwater Monitoring Plan (TtNUS, 1999).
- 4 Area A Landfill Groundwater Monitoring Plan, Volume II of the O&M Manual (TtNUS, 2006a).
- 5 Criteria listed are for trivalent chromium and hexavalent chromium.
- 6 Criteria listed are for hexavalent chromium.

Shading indicates criterion that has changed.

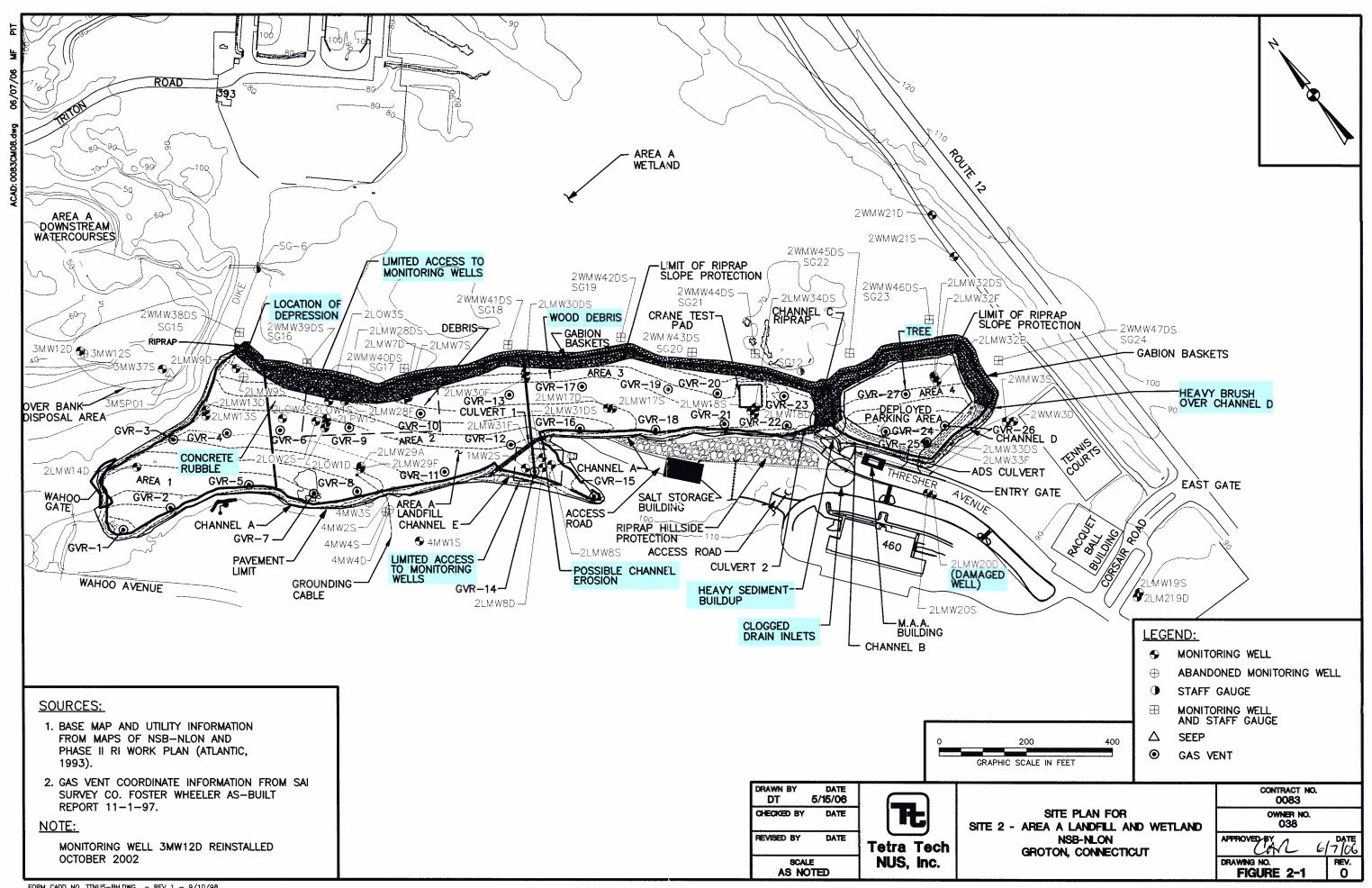
NA - Not Available.

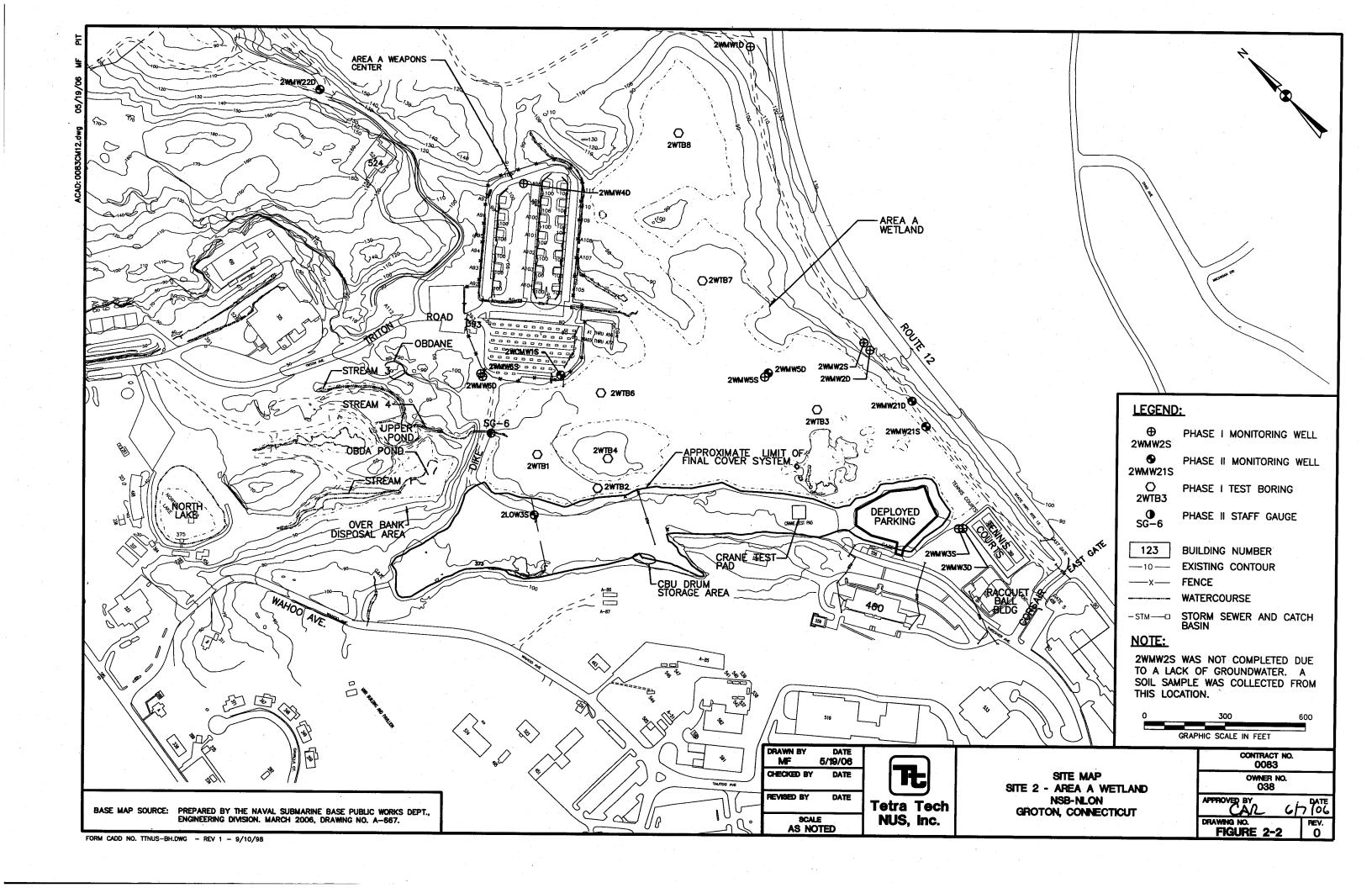
--- - Contaminant is no longer part of the monitoring program.

# **TABLE 2-5**

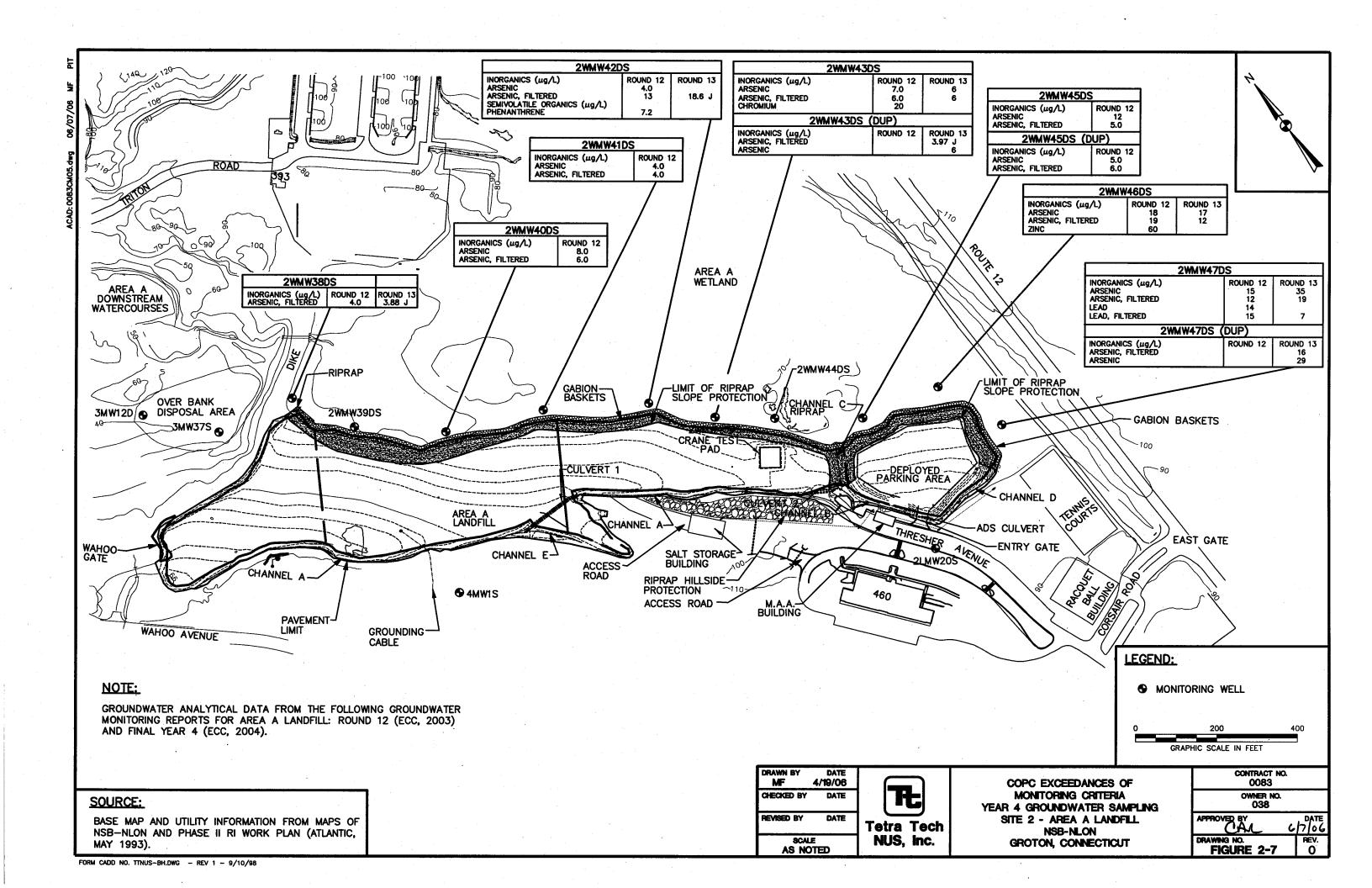
# DEFICIENCIES IDENTIFIED FOR SITE 2 – AREA A LANDFILL OU1 NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

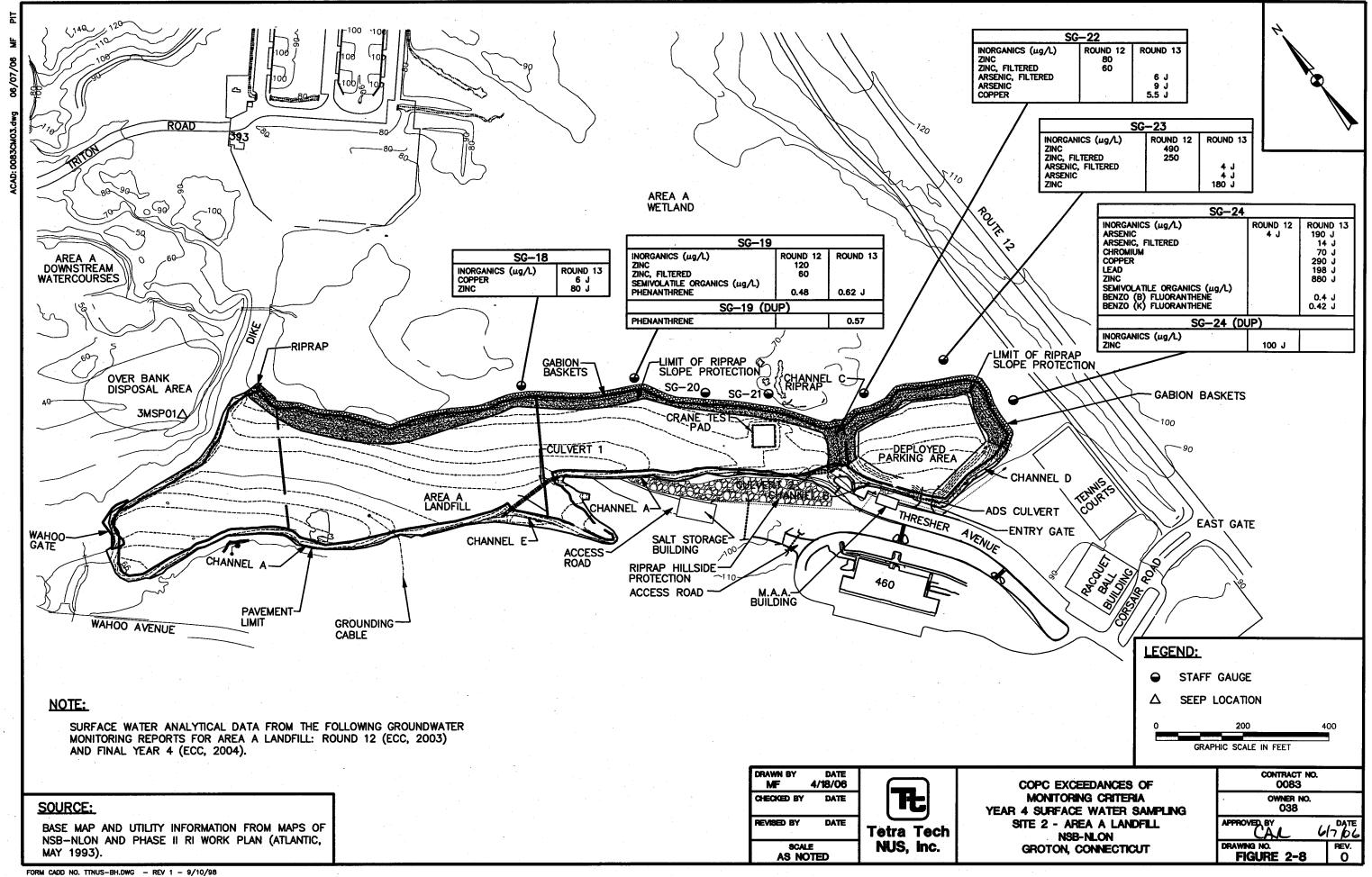
Deficiency	Effects Protectiveness			
	Current	Future		
Install screens on gas vents	N	N		
O&M of cap system [vegetation (Phragmites, trees, etc.), sediment, and asphalt cracks]	N	Y		
Improper storage of heavy equipment on cap	N	Υ		
Maintenance/abandonment of monitoring wells	Y	Y		
Depression in rip rap along toe of the landfill	N	Υ		

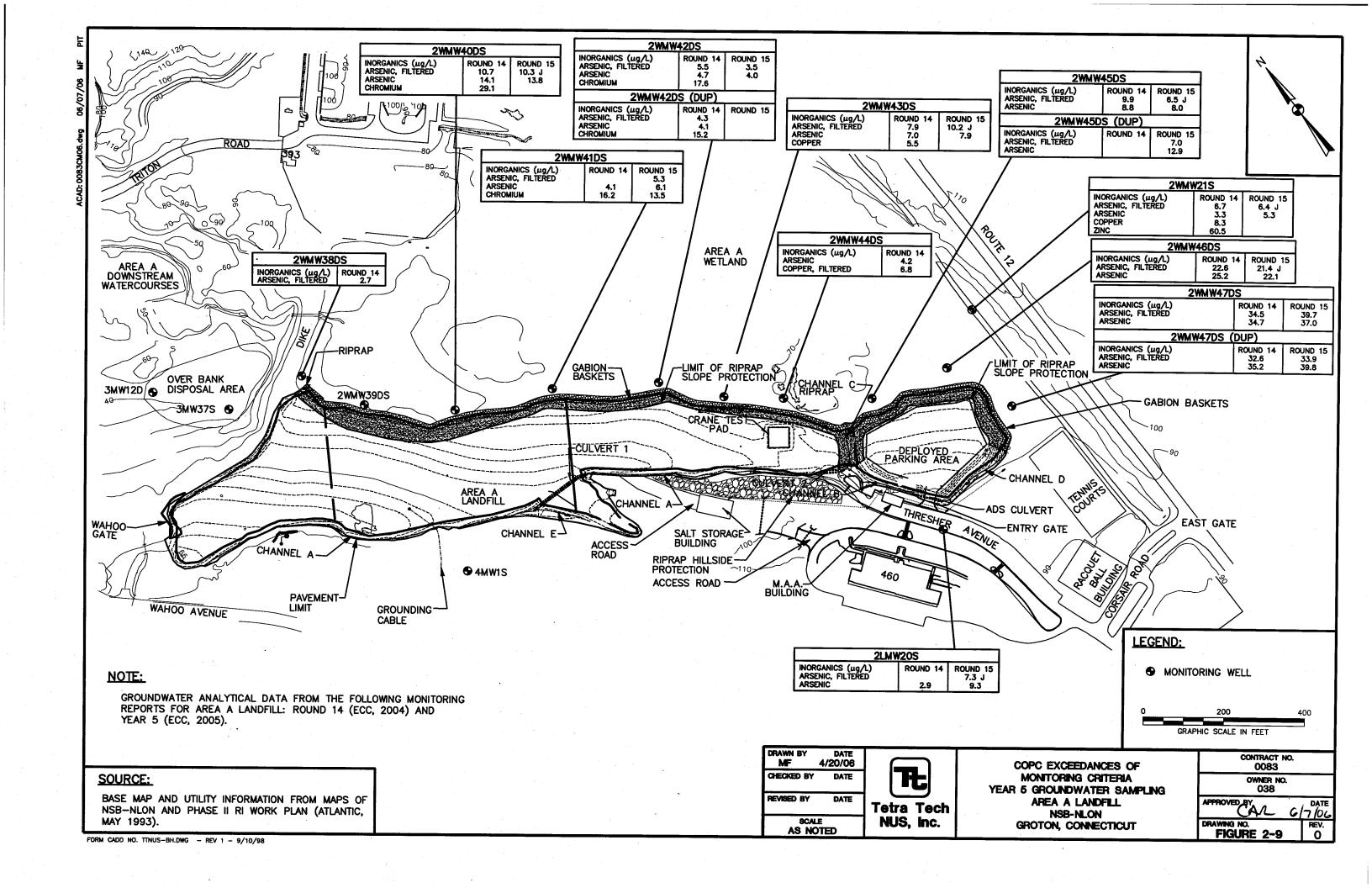


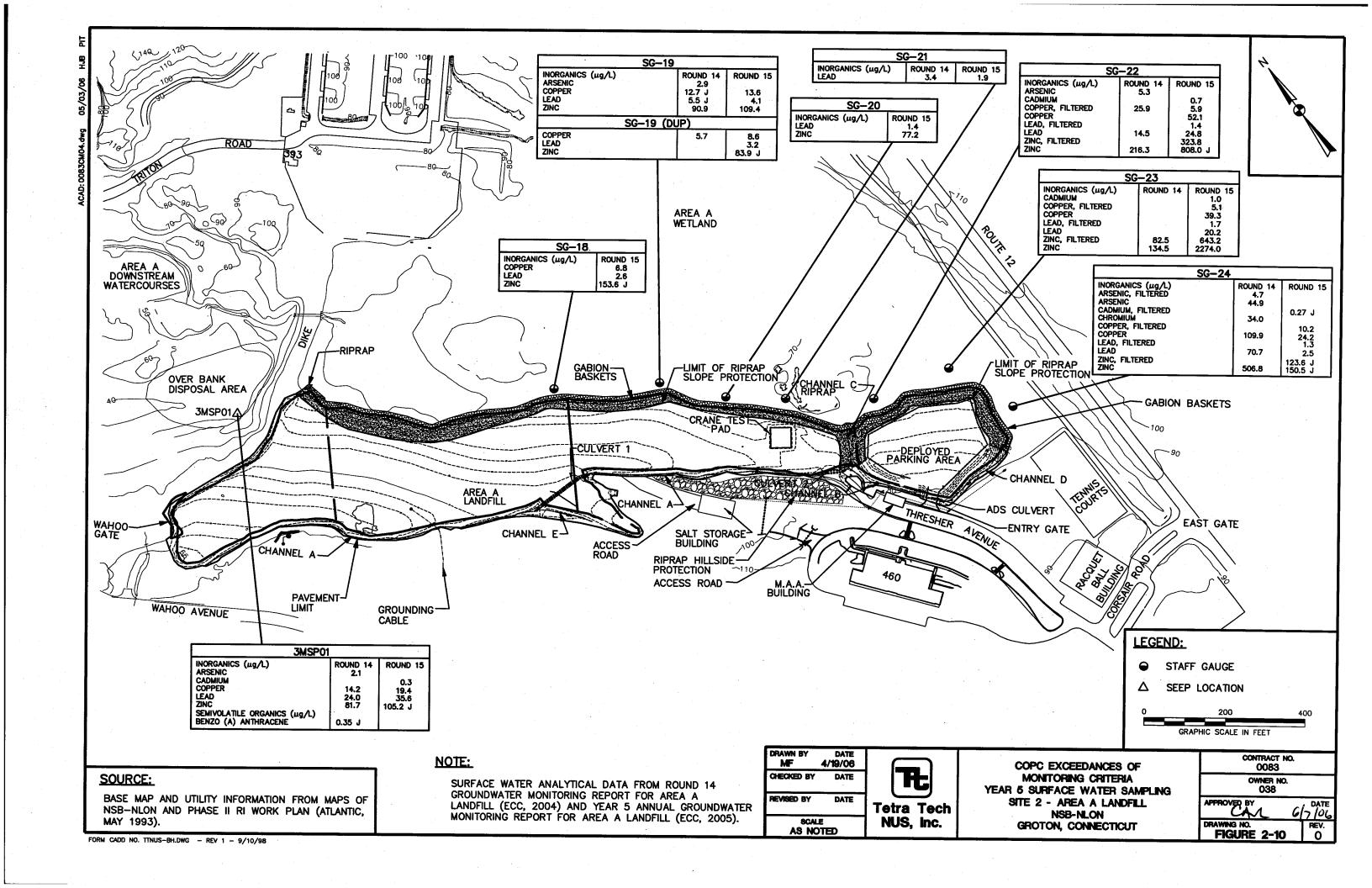


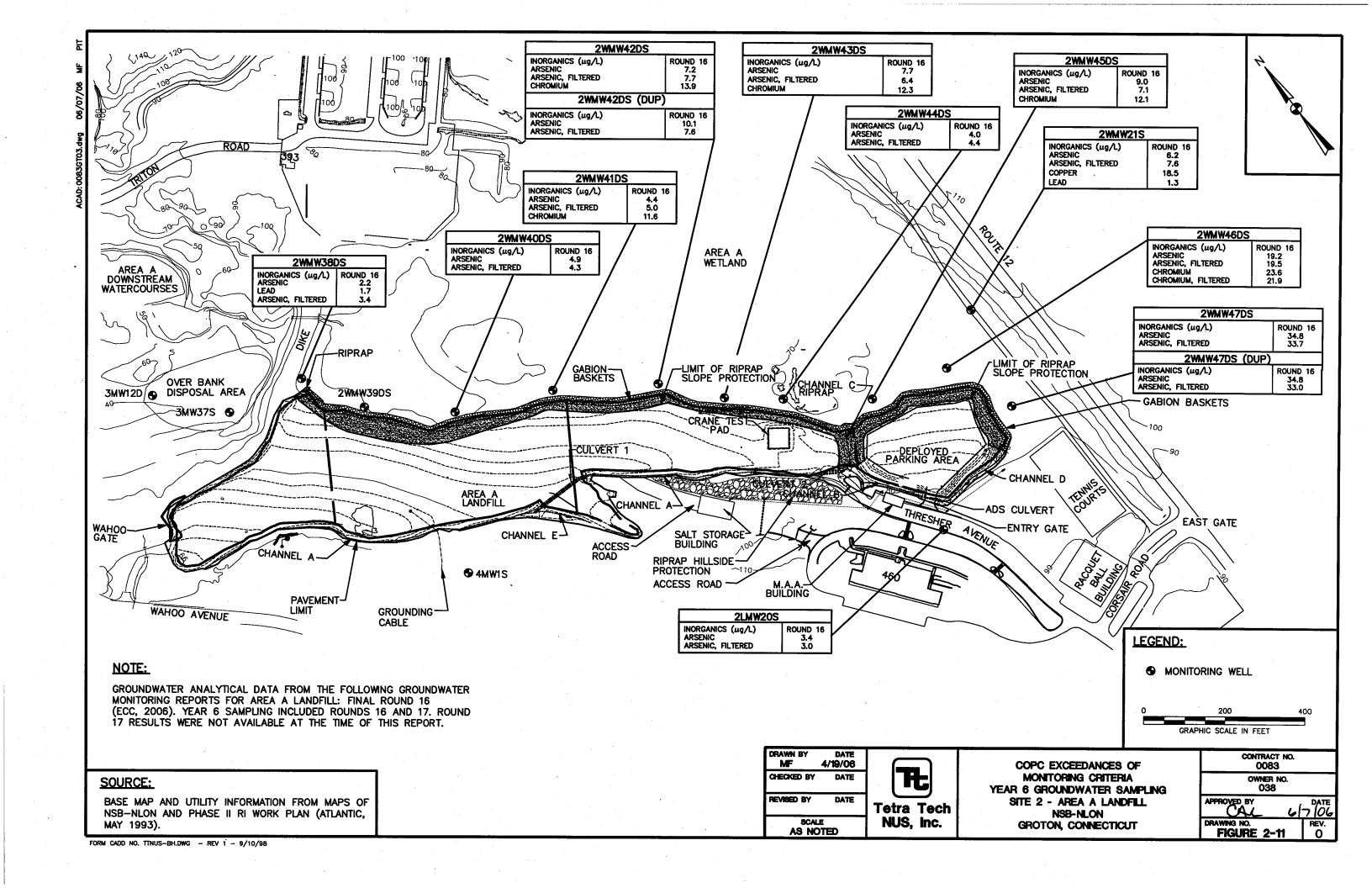
for	Area A La	andfill (TtNUS, 2003).					1	$\mathcal{J}\setminus\setminus$	300	0	300 Feet
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY K. PEILA	DATE 2/11/03	Rt Tetra Tech NUS, Inc.	CONTRACT NUMBER 0083	OWNER NUMBER CTO 038
							N. BALSAMO COST/SCHE	DATE 6/08/06 DULE-AREA	COPC EXCEEDANCES OF MONITORING CRITERIA YEAR 3 SURFACE WATER SAMPLING SITE 2 - AREA A LANDFILL	APPROVED BY APPROVED BY	DATE BOD DATE
							SCA AS NO	1	NSB-NLON, GROTON, CONNECTICUT	DRAWING NO. FIGURE 2 -	6 RI

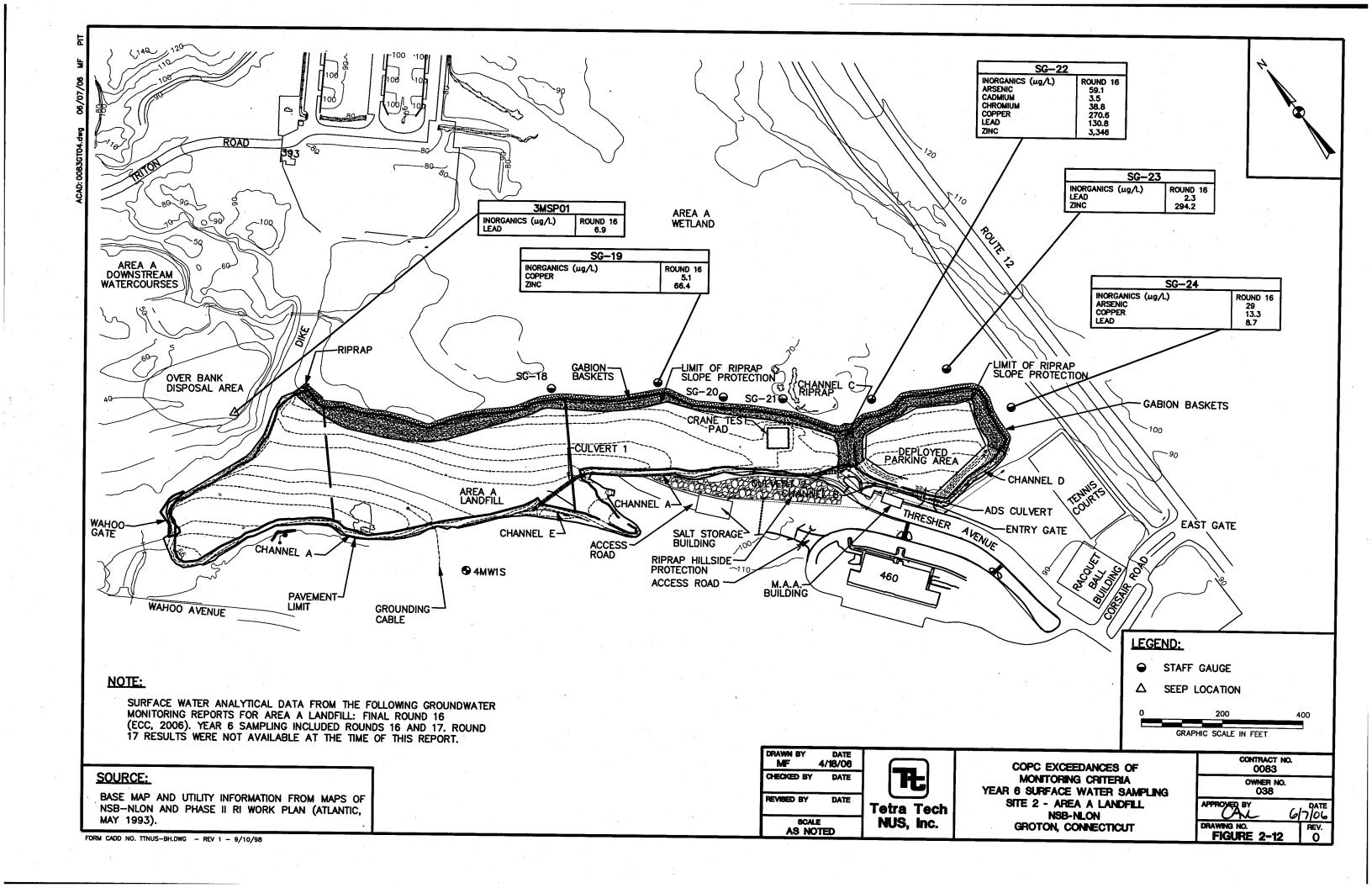












# 3.0 SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA (OU3 AND OU9)

Site 3 under the Navy's IRP includes the Area A Downstream Watercourses and the OBDA. This five-year review of Site 3 is required by statute because hazardous substances, pollutants, or contaminants remain in soil and groundwater that do not allow for unlimited use or unrestricted exposure. The soil OU associated with the OBDA was addressed through a non-time-critical removal action (NTCRA). The Action Memorandum for the OBDA was signed in July 1997 (Navy, 1997a). The soil and sediment OU (OU3) associated with the Area A Downstream Watercourses was addressed through a remedial action. The ROD for the soil and sediment OU was signed in March 1998 (Navy, 1998). After completion of the BGOURI Update/FS, an Interim ROD for the groundwater in OU9, which includes Site 3, was signed in December 2004 (Navy, 2004). The selected remedy for Site 3 groundwater is institutional controls with monitoring. The selected remedy for the groundwater at this site is an interim remedy, but it is expected that it will be the final remedy after remedial actions are selected for all portions of OU9.

## 3.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 3 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Pesticides used in waterbodies.	1960s
Final IAS completed.	March 1983
Phase I RI completed.	August 1992
Draft FFS issued.	April 1994
Phase II RI finalized.	March 1997
OBDA NTCRA completed.	March 1997
Proposed Plan for soil and sediment (OU3) issued.	July 1997
EE/CA for OBDA issued and Action Memorandum for OBDA signed.	July 1997
Final Post-Removal Report for OBDA issued.	July 1997
Public Meeting for soil and sediment (OU3) conducted.	August 1997
ROD for soil and sediment (OU3) signed.	March 1998
Remedial Design for soil and sediment (OU3) completed.	1999
Remedial Action for soil and sediment (OU3) completed.	August 2000
First Five-Year Review completed.	December 2001
BGOURI completed.	January 2002
Restoration and Long-Term Monitoring of OU3 completed.	2003
BGOURI Update/Feasibility Study completed.	July 2004
Proposed Plan for Site 3 - NSA Soil (OU3) completed.	July 2004

ROD for Site 3 - NSA Soil (OU3) signed.	September 2004		
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) issued.	September 2004		
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) signed.	December 2004		
Land Use Control (LUC) Remedial Design for Sites 3 and 7 Groundwater completed.	June 2005		
Final O&M Manual - Volumes I, II, III, IV and V	January 2006		
Work Plan for Remedial Action at Sites 3 and 7 completed.	March 2006		
Round 1 of groundwater monitoring at Sites 3 and 7 completed.	May 2006		
SOPA (ADMIN) New London Instruction 5090.18C issued.	December 2006		
Design for Site 3 – NSA soil completed.	TBD		
Remediation of Site 3 – NSA soil completed.	TBD		

#### 3.2 BACKGROUND

# 3.2.1 Area A Downstream Watercourses

The Area A Downstream Watercourses receive surface water and groundwater recharge from the Area A Landfill, Area A Wetland, Torpedo Shops, OBDA, OBDANE, and surrounding areas and convey them to the Thames River. The Area A Downstream Watercourses include North Lake and several small ponds (Upper Pond, Lower Pond, and OBDA Pond) and interconnected streams (Streams 1 through 6). The general configuration of the Area A Downstream Watercourses and adjacent areas is shown on Figure 3-1. The location of this site relative to other IR sites at NSB-NLON is shown on Figure 1-2.

The primary water discharge point from the Area A Wetland to the Area A Downstream Watercourses is through four 24-inch-diameter metal culvert pipes located within the dike that separates the Area A Wetland from the Area A Downstream Watercourses. The discharge from these culverts forms a small stream (Stream 4) that flows westward for approximately 200 feet into Upper Pond. Upper Pond discharges to Stream 3, which flows northward and then westward toward Triton Avenue (past the OBDANE site) to the entrance of the Torpedo Shops. At this location, it meets the drainage channel from the Torpedo Shops and forms Stream 5. Stream 5 flows westward along Triton Avenue through the Small Arms Range and under Shark Boulevard and eventually discharges to the Thames River at the DRMO outfall. A second pond (Lower Pond), northwest of Upper Pond, is a natural depression and is recharged by groundwater inflow. The outlet of Lower Pond forms Stream 2, which enters a storm sewer and flows west around North Lake.

Groundwater passing beneath the Area A Landfill/Wetland dike discharges to a small pond (the OBDA Pond) located at the base of the dike and the OBDA. Stream 1 flows from this pond westward toward North Lake, a recreational swimming area for Navy personnel. Under normal flow conditions, the stream enters a culvert that bypasses North Lake and discharges to Stream 6 below the outfall of the lake.

Stream 6, which is formed by Stream 1, Stream 2, and the outflow of North Lake, flows westward under Shark Boulevard and through the golf course to the Thames River. North Lake is filled with potable water every year and drained at the end of the season. Surface water levels in North Lake do not appear to coincide with groundwater levels in adjacent monitoring wells, indicating little hydraulic connection between surface water in North Lake and the shallow groundwater.

Most of Site 3 is within designated Explosive Safety Quantity Distance (ESQD) arcs of the Area A Weapons Center; therefore, further development is not planned for this area. Navy regulations prohibit construction of inhabited buildings or structures within these arcs and, although existing buildings operate under a waiver of these regulations, no further construction is planned.

The main cause of contamination at the Area A Downstream Watercourses was the application of pesticides. These pesticides were reportedly applied on the surface of water bodies to control mosquito proliferation adjacent to the nearby base recreational facilities (North Lake and golf course). Additional contaminants are inorganic constituents of river dredge spoil and Area A Landfill material carried over from adjacent sites. Samples of surface soil and sediment showed the presence of mainly DDT, 1,1-dichloro-2,2-bis(4-chlorphenyl) ethene (DDE) (collectively referred to as DDTR), and small amounts of other pesticides such as dieldrin. Samples of sediment also contained relatively high levels of several metals (such as arsenic, beryllium, cadmium, lead, and zinc) compared to less contaminated reference areas outside the site.

A two-phase RI/FS was conducted to investigate and determine appropriate remedial alternatives for Site 3. Phase I RI field activities were conducted from 1990 to 1992 (Atlantic, 1992) and included test borings, monitoring well installation, and soil, surface water, sediment, and groundwater sampling. The RI concluded that risks associated with several exposure scenarios exceeded acceptable regulatory levels and that an FS should be performed for the site. A draft FFS (Atlantic, 1994c) was completed for the soil and sediment at the site. Additional soil and sediment samples were collected and analyzed during the FFS to further define the extent of contamination. The FFS concluded that off-site landfilling and on-site thermal desorption provide superior protection of the environment and that the landfilling alternative would be more cost effective than the on-site thermal desorption alternative.

Phase II RI field activities were conducted from 1993 to 1995 (B&RE, 1997a) and included test borings, monitoring well installation, and soil, surface water, sediment, and groundwater sampling. A soil gas survey and an extensive ecological investigation were also completed during the Phase II RI. The Phase II RI concluded that VOCs were present in groundwater at Site 3, that the site poses noncarcinogenic risks to the site worker and older child trespasser, and that notable concentrations of pesticides exist in site soil and sediments. The Phase II RI recommended that the FS for this site be revisited to focus on

pesticides in soil and sediment, that more sampling is required to delineate pesticide contamination and determine the origin of VOCs in groundwater, and that the debris associated with the OBDA should be removed.

Following the Phase II RI, an FS was completed in 1997 for soil and sediment at Site 3 (B&RE, 1997g). An alternative that included dredging, on-site dewatering, off-site disposal of sediment and soil, restoration of wetlands and waterways, and monitoring was selected for the site, and the selected remedy was documented in a ROD signed in March 1998 (B&RE, 1998d). A Remedial Design was completed for soil and sediment at Site 3 in 1998 and 1999 (FWEC, 2000), and the Remedial Action for Site 3 soil and sediment was completed in 1999 and 2000. The following general tasks were completed during the remedial action:

- Dewater and treat water, if necessary.
- Properties sampling for match to fill material prior to excavation.
- Excavate soil/sediment and load directly to front-end loader.
- Transfer soil/sediment to material-handling pad.
- Sample excavated soil and sediment for waste characterization purposes prior to stabilization.
- Sample excavation sidewalls/base at the frequency specified in the Sampling and Analysis Plan.
- Perform field immunoassay screening in conjunction with off-site laboratory analysis for pesticides and metals.
- Backfill or continue excavation based on field screening and laboratory analysis.
- Mix contaminated sediment on material handling pad with stabilizing agent.
- Load stabilized material onto dump trucks and transport to disposal/recycling facility.

Approximately 18,050 tons of soil and sediment were excavated and disposed off-site during the remedial action. Post-excavation confirmatory sampling and analysis were performed to confirm that remedial goals had been met prior to closing the excavation. Post-construction restoration and long-term monitoring were conducted for 3 years at the site to ensure that vegetation and habitat were properly restored.

Groundwater at Site 3 was further investigated during the BGOURI in 2000, but the results of the investigation were inconclusive and data gaps remained. To address the newly found Site 3 – NSA and the data gaps identified during the BGOURI, a Data Gap Investigation (DGI) (TtNUS, 2002e) was completed in the fall of 2002 prior to initiating an FS. The results of the DGI were presented in the BGOURI Update/FS (TtNUS, 2004).

The soil sampling program and a portion of the groundwater sampling program were concentrated on determining the overall nature and extent of contamination at the Site 3 – NSA. The remaining portion of the groundwater sampling program was focused on confirming the nature and magnitude of the groundwater contamination identified during the BGOURI. Petroleum contamination was identified at the Site 3 – NSA during the DGI; however, no significant source of VOC contamination was identified at the Site 3 – NSA.

The groundwater data collected during the DGI indicated that VOCs were originally released upgradient in the vicinity of Site 7 and are in the process of migrating through Site 3. It is likely that the primary original compound released was trichloroethene (TCE). There were detections of VOCs along Stream 5 from Site 7 to the Thames River. Comparisons of results from the Phase II RI, BGOURI, and DGI show that VOC concentrations in groundwater are decreasing steadily and that degradation products from the dechlorination of TCE have been detected, indicating that natural attenuation is occurring.

An FS was completed to identify and evaluate appropriate remedial alternatives for the soil at Site 3 – NSA and the groundwater at Site 3 (TtNUS, 2004). A ROD was signed for the Site 3 – NSA soil in September 2004 (Navy, 2004e). The ROD called for NFA for the petroleum-contaminated soil under CERCLA because petroleum is excluded from consideration under CERCLA; however, the Navy's cleanup plan to address the petroleum-contaminated soil under other applicable regulations was also detailed in an appendix to the ROD. The Navy anticipates completion of the cleanup of the debris and contaminated soil at Site 3 – NSA by the end of 2006.

Institutional controls and monitoring were selected as the remedy for Site 3 groundwater in the Interim ROD in 2004 (Navy, 2004h). A Remedial Design for Land Use Controls was subsequently completed for Site 3 groundwater in June 2005 (TtNUS, 2005). The Navy began implementation of the groundwater monitoring program as described in the Remedial Action Work Plan (TtNUS, 2006b) and Site 3 Groundwater Monitoring Plan (TtNUS, 2006a) in January 2006.

# 3.2.2 **OBDA**

The OBDA was located on the slope of the dike below and adjacent to the Area A Landfill. It was located on the southwestern end of the dike where the angle of the slope approaches 45 degrees. A small wetland at the base of the dike has been designated as the OBDA Pond. The OBDA was used as a disposal site after the earthen dike was constructed in 1957. The IAS Report (NEESA, 1983) indicated that the material had been there for many years. The IAS Report also indicated that the materials were not covered and included 30 partially covered 200-gallon metal fuel tanks and scrap lumber. The site was inspected in 1998, and it was observed that the tanks were still present at the site and old creosote telephone poles, several empty unlabeled 55-gallon drums, and rolls of wire were present at the site.

Orange iron floc was observed in sediments in the area where water was discharging from the base of the dike embankment.

As discussed above, the OBDA Pond, located downgradient of the OBDA, was investigated as part of the Area A Downstream Watercourses during the Phase I and II RIs and the FFS and FS for the site. No investigative activities were completed within the limits of the disposal area. All the debris from the OBDA area was removed and disposed off site as part of a NTCRA in 1997. This removal action was completed during the Area A Landfill Remedial Action because the sites are located adjacent to one another. An EE/CA and Action Memorandum were prepared in 1997 to document the decision process for the NTCRA (Navy, 1997a).

## 3.3 REMEDIAL ACTIONS

## 3.3.1 Remedy Selection

#### 3.3.1.1 Area A Downstream Watercourses

# Soil and Sediment

Following the Phase II RI, an FS for soil and sediment at Site 3 was completed (B&RE, 1997g). No additional samples were collected during the study. Four remedial alternatives were evaluated during the FS. Although groundwater was not the focus of the FS, the cross-medium impact from contaminated soil and sediment was considered during the evaluation of alternatives. Based on site information such as types of contaminants, environmental media of concern, and potential exposure pathways, RAOs were developed to aid in the development of alternatives. The following RAOs were selected to mitigate existing and future potential threats to public health and the environment from the soil and sediment OU (OU3):

- Protection of potential human receptors by preventing incidental ingestion of contaminated soil and sediment containing DDT, DDD, and dieldrin at concentrations exceeding 27 mg/kg, 38 mg/kg, and 0.57 mg/kg, respectively.
- Protection of potential human receptors by preventing incidental ingestion of sediment containing arsenic and beryllium at concentrations exceeding 6.1 mg/kg and 2.1 mg/kg, respectively.
- Protection of ecological receptors by preventing contaminated soil (containing DDTR concentrations exceeding 5.6 mg/kg, rounded down to 5.0 mg/kg to be conservative) and contaminated sediment (containing DDTR concentrations exceeding 2.0 mg/kg and dieldrin concentrations exceeding 0.045 mg/kg) from entering the food chain.

 Protection of ecological receptors from potential toxicity of sediment containing cadmium, lead, and zinc at concentrations exceeding their respective effects range-medium (ER-M) values of 9.6 mg/kg, 218 mg/kg, and 410 mg/kg.

The preferred alternative selected in the FS and documented in the ROD was excavation of contaminated soil and sediment followed by on-site dewatering and disposal at an off-site landfill. The sequence of actions envisioned at the conceptual stage were as follows: (1) removal, on-site treatment, and discharge of standing water from ponds and streams with appropriate stream flow diversions; (2) clearing/grubbing of contaminated soil areas; (3) dredging, on-site dewatering, and off-site disposal of contaminated sediment; (4) excavation, on-site dewatering, and off-site disposal of contaminated soil; (5) placement of clean soil backfill over the excavated soil areas with topsoil cover and revegetation to replace altered wetland functions and values; and (6) placement of suitable borrow material over the dredged sediment areas (such as sand in ponds and gravel in streams) and restoration of aquatic habitats. It was assumed that fencing and security measures would be present and would continue during the remedial action.

The remedial goals selected for the soil and sediment remedial action are summarized in Table 3-1. The arsenic and beryllium remedial goals were derived for protection of human receptors, and the remaining remedial goals were derived for protection of ecological receptors of concern. The ecological remedial goals are sufficiently low to be protective of human receptors of concern. The human health remedial goals are contaminant concentrations that would reduce potential health risks to receptors of concern (i.e., older child trespasser and construction worker) to acceptable levels. The bases for the ecological remedial goals are as follows:

- The soil remedial goal for DDTR was based on potential impacts to the short-tail shrew via ingestion of soil and contaminated prey items. The no-observed-adverse effects level (NOAEL) used for the shrew was 0.8 mg/kg-day (Opresko et al., 1994). The soil-to-earthworm bioaccumulation factor (BAF) was determined based on a site-specific bioaccumulation study. The exposure parameters in the food-chain model (i.e., ingestion rates) were obtained from the Wildlife Exposure Factors Handbook (USEPA, 1993b).
- The sediment remedial goals for metals were based on the ER-M value from Long et al. (1995).
- The sediment remedial goal for DDTR is based on empirical relationships between effects to benthic macroinvertebrates and DDTR concentrations.

The sediment remedial goal for dieldrin is based on equilibrium partitioning using site-specific TOC concentrations, chemical-specific K<sub>oc</sub> value, and water-quality screening value (WQSV) for dieldrin. The WQSV for dieldrin (0.062 μg/L) was obtained from the draft Sediment Quality Criteria for the Protection of Benthic Organisms: Dieldrin (USEPA, 1993a) and was used because it is based on risks to aquatic organisms.

The cost associated with the selected remedy was estimated to be \$8,125,000. The cost for wetland restoration and O&M for years 0 through 5 was estimated at \$50,000 per year.

The Remedial Design for the soil and sediment OU began in 1998 and was completed in 1999. Additional sampling was conducted in the fall and winter of 1998 to further delineate the extent of contamination. The focus of the design was to develop a work plan and construction drawings that showed the details for excavating and disposing of the contaminated soil and sediment. The work plan and drawings developed described and showed construction sequencing, equipment lay-down areas, stream and pond dewatering details, dewatering pads, site restoration details, final grading plans, erosion and sediment control details, etc. for the remedial action. A verification sampling plan was also included in the work plan. The goal of the plan was to verify that the remedial action met the remedial goals defined above.

## Groundwater

Remedial alternatives for Site 3 groundwater were developed and evaluated in the BGOURI Update/FS (TtNUS, 2004) to meet the following RAOs:

- Protect current receptors (construction workers) from incidental exposure to groundwater contaminated with petroleum and chlorinated hydrocarbons at concentrations greater than PRGs.
- Protect potential future receptors (potable water supply) from regular ingestion of groundwater contaminated with chlorinated hydrocarbons at concentrations greater than PRGs.
- Protect aquatic ecological receptors by preventing the migration of groundwater contaminated with petroleum hydrocarbons at concentrations greater than PRGs to surface water.

The two alternatives developed and evaluated during the FS were No Action and Institutional Controls with Monitoring. A remedy of Institutional Controls with Monitoring was selected for Site 3 groundwater in an Interim ROD (Navy, 2004c) to address the potential risks to future receptors from exposure to groundwater. Risks to current human and ecological receptors were shown not to be of significant concern, but there are potentially significant risks to hypothetical future human receptors from routine,

long-term consumption of contaminated groundwater. It is expected that the selected remedy for groundwater at Site 3, a portion of OU9, will be the final remedy after remedial actions are selected for all portions of OU9. The selected remedy complies with regulatory requirements and includes the following major components:

- Implementation of institutional controls that identify the location and magnitude of groundwater contamination and restrict extraction and use of the groundwater. The details of the administration of institutional controls will be provided in the remedial design documentation. In the event of property transfer and with confirmation that contaminated groundwater remains at the sites, a deed restriction would be used to prohibit the use of groundwater.
- Monitoring the degradation and potential migration of groundwater contaminants until concentrations
  decrease to the remedial goals in Table 3-2 by natural processes and until the resulting
  concentrations are shown to be protective of human health and the environment. Additional details
  regarding the scope and duration of the monitoring program will be provided in the groundwater
  monitoring plan.

The estimated cost of the selected remedy for Site 3 groundwater in the ROD was \$319,500, which included capital, monitoring, and O&M costs. A Remedial Design for Land Use Controls was subsequently completed for Site 3 groundwater in June 2005 (TtNUS, 2005). The Navy also prepared the Remedial Action Work Plan (TtNUS, 2006b) and Site 3 Groundwater Monitoring Plan (TtNUS, 2006a) to address implementation of the groundwater monitoring program at Site 3.

# 3.3.1.2 OBDA

The decision process for selecting the NTCRA for OBDA was documented in the Action Memorandum for the OBDA (Navy, 1997a). The NTCRA was completed to eliminate the potential threat to human and ecological receptors caused by the migration of contamination from potentially leaking tanks, drums, or other containers. It was determined that the most effective way to address this threat was to perform a NTCRA and dispose of the material off site. Other actions considered included institutional controls and containment. The ARARs/TBCs for the NTCRA were CTDEP Pollutant Mobility Criteria, CTDEP Direct Exposure Criteria for soil, and FFDC action tolerance levels. The estimated cost of the NTCRA, as presented in the Action Memorandum, was \$500,000.

# 3.3.2 Remedy Implementation

#### 3.3.2.1 Area A Downstream Watercourses

## Soil and Sediment

The remedial action for the Area A Downstream Watercourses/OBDA soil and sediment OU (OU3) was completed during July 1999 and August 2000. The details of the remedial action were documented in the Remedial Action Completion Report for Area A Downstream/OBDA Remediation (Foster Wheeler, 2001a). The actual cost of remediation was approximately \$6,000,000. This cost does not include O&M costs.

Remediation and restoration of the site was completed in phases (i.e., Phases I through VI). The waterbodies addressed in each phase are as follows.

- Phase I Stream 4
- Phase II Stream 3
- Phase III Stream 5
- Phase IV Upper Pond
- Phase V Lower Pond/Stream 2
- Phase VI OBDA Pond/Stream 1/Base of OBDA Slope/Discharge Channel Structure

Although conditions varied between watercourses, the following general tasks were completed during each phase:

- Dewater and treat water as necessary.
- Perform properties sampling for match to fill material prior to excavation.
- Excavate soil/sediment and load directly to front-end loader.
- Transfer soil/sediment to material-handling pad.
- Sample excavated soil and sediment for waste characterization purposes prior to stabilization.
- Sample excavation sidewalls/base at the specified frequency.
- Perform field immunoassay screening in conjunction with off-site laboratory analysis for pesticides and metals.
- Backfill or continue excavation based on field screening and laboratory analysis.
- Mix contaminated sediment on material handling pad with stabilizing agent.
- Load stabilized material onto dump trucks and transport to disposal/recycling facility.

Approximately 18,050 tons of soil and sediment were excavated and disposed off-site during the remedial action. Post-excavation confirmatory sampling and analysis was performed to confirm that remedial goals at each excavation had been met prior to closing the excavation. Field sampling and screening for DDTR was used as the decision-making tool regarding excavation depth and area.

Several changes were made to the Remedial Design during the Remedial Action. The most significant change occurred during the remediation of Stream 4. Abandoned pipes were uncovered during the excavation of soil and sediment at the headwaters of the stream. Stream 4 is formed by the discharge from the Area A Wetland. These abandoned pipes were below the existing outlet structure for the Area A Wetland. It was felt that excavation and removal of the pipes would compromise the integrity of the Area A Wetland dike. Analytical results for a soil sample collected from around the pipes showed a concentration of DDTR of approximately 33 mg/kg, which is above the soil remediation goal of 5 mg/kg. To address the problem, the area around the piping was isolated and encapsulated using a cement/bentonite grout. In order to minimize erosion immediately beneath the Area A Wetland outfall structure, concrete was placed to form an apron and anchor the rock structure in part of the excavation. An Explanation of Significant Differences (ESD) needs to be prepared to document the change to the Remedial Action.

To meet the land use control requirements in the ROD, the Navy implemented an instruction [i.e., SOPA (ADMIN) New London Instruction 5090.18 (Navy, 2000b)] to restrict use at IR sites at NSB-NLON. The instruction defines the Navy's policy regarding ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites. Other components of the remedial action, including long-term monitoring and O&M, are discussed in Section 3.3.3.

## Groundwater

A Remedial Design for Land Use Controls was completed for Site 3 groundwater in June 2005 (TtNUS, 2005). The Navy incorporated the information in the Remedial Design into the New London Instruction 5090.18C (Navy, 2006b).

The objective of the Site 3 Groundwater Monitoring Plan is to conduct long-term monitoring of the degradation and potential migration of COCs until concentrations decrease to remedial goals by natural processes and until the resulting concentrations are shown to be protective of human health and the environment. The monitoring program will continue until compliance with remedial goals within the site boundaries are shown, and it is confirmed that contamination is not migrating from the site at concentrations in excess of remedial goals. The groundwater at Site 3 is designated as GB by the State of Connecticut; however, the Navy's goal for groundwater remediation at these sites is to meet GA requirements to eliminate groundwater use restrictions in the future. Based on State regulations,

monitoring can be discontinued after 3 years of data that show compliance with the applicable criteria. After the monitoring program can be discontinued, the groundwater use restrictions can be eliminated, and five-year reviews will no longer be necessary at the site. Annual reports will be issued to summarize the results of the monitoring program and provide thorough evaluations of each year of data collected under the program.

The Navy began implementation of the Groundwater Monitoring Program as described in the Remedial Action Work Plan (TtNUS, 2006b) and Site 3 GMP (TtNUS, 2006a) in May 2006. Four new monitoring wells were installed at Site 3 to complete the monitoring well network. A total of nine monitoring wells (five existing and four new) were then sampled and analyzed for VOCs under the monitoring program. The monitoring program will initially consist of quarterly sampling events. The analytical program and monitoring well network will be modified as necessary in the future as the monitoring program is optimized.

#### 3.3.2.2 OBDA

The NTCRA for the OBDA was completed during January 1997 and March 1997. The details of the NTCRA were documented in the Final Post Removal Action Report for Over-Bank Disposal Area (FWEC, 1997b). Tanks, large metal items, timbers, and miscellaneous construction debris resting on or protruding through the existing ground surface were removed from the OBDA during the NTCRA. Material removed from the site was decontaminated, if necessary, stockpiled, and subsequently transported off site for disposal. Potentially contaminated debris was wipe sampled and analyzed for DDT. Soil was also sampled and analyzed for DDT. DDT was not detected in either sample. After excavation, rock was placed in the excavation to stabilize it, and then the excavation area was restored with topsoil and hydroseeded.

# 3.3.3 System Operations/Operation and Maintenance

## 3.3.3.1 Restoration and Long-Term Monitoring

#### Restoration

As a result of soil and sediment excavation and removal during the Site 3 remedial action, 2.90 acres of palustrine wetlands were disturbed. Compensatory mitigation for this impact required the restoration of 2.43 acres of palustrine wetlands and 0.47 acre of open water. All areas excavated during the Area A Downstream/OBDA remedial action were restored and reseeded in accordance with the Wetland Restoration Plan in the 100% Design (FWEC, 2000). This activity was considered Stage 1 of restoration activities and was completed on August 24, 2000. Vegetation, hydrologic conditions, and fish and wildlife use at Site 3 were monitored weekly between August 14 and October 26, 2000. A baseline benthic

survey was also conducted in October 2000 in conjunction with the post-construction monitoring. The results of the monitoring were documented in the Post Construction Monitoring Report, Area A Downstream/OBDA (FWEC, 2001b). In general, all of the initial monitoring results were positive and indicated that restoration activities were successful. Planting of woody species (i.e., shrubs and trees) at Site 3 was completed in April and May 2001. This activity was considered Stage 2 of the restoration activities.

# **Long-Term Monitoring**

As detailed in the final Long-Term Wetland Monitoring Plan (FWEC, 2001c), long-term monitoring consisted of four components: vegetation, soils, hydrology, and functions and values. Long-term monitoring commenced upon the completion of the Stage 2 plantings. The performance standards for the monitoring are as follows:

## Vegetation

- A minimum of 80 percent areal cover, excluding planned open water areas, by non-invasive hydrophytic species for all seeded areas.
- Greater than 50 percent of dominant plant species that have a wetland indicator status of facultative (FAC), facultative wetland (FACW), or obligate wetland (OBL) with no more than 50 percent of FAC species.
- For planted woody species, a minimum of 80 percent survival based on stem count.
- A 20 percent increase in tree height and diameter at breast height.

#### Soils

• Trend towards hydric condition within the upper 18 inches of the soil profile.

# Hydrology

 Emergent zone hydrology that consists of soil saturated to the surface, water on the surface, or a combination of surface water and saturated soils for at least 10 consecutive days during the growing season.  Scrub/shrub and forested zone hydrology that consists of soil saturated to the surface, or the groundwater table within 10 inches of the surface, for at least 10 consecutive days of the growing season.

#### **Functions and Values**

- All streams and ponds show a trend toward greater biological diversity in the benthic invertebrate community.
- Post-remedial functions and values equal to or greater than pre-remedial functions and values.
- Predicted potential habitat for 27 percent (16) of all wetland-dependent amphibians, reptiles, and mammals evaluated by the WEThings Method.
- Restoration of 1.26 acres of emergent wetland, 1.17 acres of scrub/shrub/forested wetland, and
   0.47 acres of open water.

# Year 1 of Long-Term Monitoring

The Year 1 monitoring results were documented in the Final Year 1 Long-Term Monitoring Report (FWEC, 2002d). The results indicated that the restored wetlands at Site 3 are progressing in a positive direction towards achieving the performance standards. The 2001 monitoring event indicated that the soils and hydrology performance standards have been met and that conditions are favorable for all criteria to be met in the next two growing seasons. Biological diversity is also increasing in the streams and ponds. Regarding vegetation, herbaceous communities appear to be healthy and thriving, invasive vegetation is still present and threatens to expand, and woody plantings indicate steadily progressing, extensive deer browse damage, especially to certain woody sapling species. The following corrective actions were proposed for 2002 to enhance and expedite natural development of the restored wetland communities and to ensure that long-term monitoring goals are met:

- Manually remove and/or apply herbicide to invasive vegetation
- Apply deer repellant on all planted trees
- Prune deer browsed trees and shrubs

## Year 2 of Long-Term Monitoring

The Year 2 monitoring results were documented in the Final Year 2 Long-Term Monitoring Report (FWEC, 2003). The results indicated that the restored wetlands at Site 3 were generally progressing in a

positive direction towards achieving the performance standards; however, there were some setbacks caused by drought conditions. The 2002 monitoring event indicated that the soils and hydrology performance standards were met. Biological diversity, in particular the macroinvertebrate community, decreased during Year 2, primarily due to the drought conditions. The herbaceous communities at Site 3 appeared to be healthy and thriving during Year 2, but invasive vegetation is still present and threatens to expand, and the drought and deer browse continued to impact woody plantings (survival rate decreased to 59.5 percent). The corrective actions recommended in Year 1 were implemented during Year 2 and limited replanting of damaged/dead trees and shrubs took place in October 2002. The following corrective actions were proposed for 2003 to enhance and expedite natural development of the restored wetland communities and to ensure that long-term monitoring goals are met:

- Continue to manually remove and/or apply herbicide to invasive vegetation
- Apply deer repellant on all planted trees

# Year 3 of Long-Term Monitoring

The Year 3 monitoring results were documented in the Final Year 3 Long-Term Monitoring Report (FWEC, 2004). The results indicated that the restored wetlands at Site 3 generally continued towards or met the identified performance standards. The monitoring results showed that the soils and hydrology performance standards were met. The biological diversity standards were met in all streams and ponds, with the exception of Stream 2, during the year. The physical characteristics of Stream 2 (intermittent flow, poorly defined channel, and nearly complete overgrowth by vegetation) limit the likelihood that a diverse and robust benthic community will develop. The herbaceous communities at Site 3 appeared to be healthy and thriving during Year 2, and the areal coverage standard was met. However, invasive vegetation is still present and requires continued maintenance. The monitoring showed that the survival standard for shrubs was met, but the results showed that the standard for trees was not met. Deer browse was the main problem in meeting the standard for tree growth. The report recommended allowing natural restoration of trees from existing seed sources instead of replanting. The corrective actions recommended in Year 2 were implemented during Year 3, and the following corrective actions were proposed for 2004 to allow continued natural development of the restored wetland communities:

- Continue to manually remove and/or apply herbicide to invasive vegetation
- Apply deer repellant on all planted trees

However, because the performance standards were generally met by the end of Year 3, restoration was considered complete, and the Navy opted not to continue the long-term monitoring program and corrective actions in Year 4.

# 3.3.3.2 Groundwater Monitoring Program

No O&M costs have been incurred for the groundwater remedy. As presented in the BGOURI Update/FS the estimated present worth cost of groundwater monitoring activities at Site 3 for the first 5 years is \$108,300. This cost estimate assumes quarterly sampling the first year, annual monitoring the next 4 years, and minimal maintenance of monitoring wells.

## 3.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 3. The recommendations from the First 5-Year Review Report are provided below along with the actions taken to address the recommendations.

# Continue post-construction/long-term monitoring and restoration program.

The post-construction monitoring and restoration program was conducted for 3 years (2001, 2002, and 2003). A majority of the program's performance standards were met by the end of 2003, completing the program. No additional monitoring was required.

# Address erosion of Stream 5.

No corrective actions were taken to correct the minor area of erosion in Stream 5. The area of
erosion has not increased and does not pose a significant concern.

## Complete planning documents and conduct the removal action for the NSA.

 The Proposed Plan and ROD for Site 3 – NSA soil were completed. The planning documents and the removal action for Site 3 – NSA are expected to be completed in 2006.

# Maintain the existing monitoring well network and/or properly abandon unnecessary monitoring wells.

• Limited maintenance of the existing monitoring well network was performed. Nine monitoring wells were redeveloped in anticipation of the Site 3 groundwater monitoring program. A well abandonment program was not developed or executed.

# Continue the RI/FS process and develop and implement an appropriate remedial alternative for the groundwater OU.

 The FS, Proposed Plan, Interim ROD, Remedial Design for Land Use Controls, Remedial Action Work Plan, and Groundwater Monitoring Plan for Site 3 groundwater were completed. The Navy is currently implementing the Remedial Action Work Plan and Groundwater Monitoring Plan.

# **Enforce New London Instruction 5090.18B.**

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Instruction 5090.18B). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2 - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been followed by personnel at NSB-NLON, and no uncontrolled disturbances of soil or groundwater at Site 3 have occurred.

## 3.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the 5-year review process and the actions taken to complete this review.

# 3.5.1 Document Review

The documents reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

BGOURI	January 2002
Final Year 1 Long-Term Monitoring Report (Restoration)	November 2002
Final Year 2 Long-Term Monitoring Report (Restoration)	June 2003
BGOURI Update/FS	July 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Final Year 3 Long-Term Monitoring Report (Restoration)	October 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	December 2004
LUC Remedial Design for Sites 3 and 7 Groundwater	June 2005
Final O&M Manual - Volumes I and II	January 2006
Work Plan for Remedial Action at Sites 3 and 7	March 2006
SOPA (ADMIN) New London Instruction 5090.18C	December 2006

# 3.5.2 Data Review

Since the first five-year review, additional monitoring and groundwater data have been collected at Site 3. The site restoration monitoring results are discussed in Section 3.3.3.1. Additional groundwater data were collected at Site 3 during the BGOURI DGI in 2002 (TtNUS, 2004). The concentrations of chlorinated VOCs (i.e., TCE, dichloroethene, and vinyl chloride) detected during the most recent investigation were less than concentrations detected during previous investigations, indicating that a continuing source of contamination is not present and that natural degradation processes are occurring. The VOCs were detected primarily along Stream 5 at concentrations less than 10  $\mu$ g/L. It was the conclusion of the DGI that the chlorinated VOCs were released to groundwater via the two septic systems and associated leach fields at Site 7 and that contaminants are migrating downgradient through Site 3 towards the Thames River.

The Navy recently initiated the Groundwater Monitoring Plan for Site 3 groundwater. The data from the program will be available and included in the next five-year review.

# 3.5.3 ARAR and Site-Specific Action Level Changes

#### 3.5.3.1 Soil and Sediment

The selected remedy for soil and sediment at the Area A Downstream was excavation and off-site disposal of the material. The ARARs/TBCs considered during preparation of the ROD are presented in Tables 3-3, 3-4, and 3-5. These ARARs/TBCs were generally met during implementation of the remedial action. No new human health ARARs have been promulgated that would call into question the protectiveness of the remedy for soil and sediment.

Remedial action goals for arsenic and beryllium were based on potential impacts to older child trespassers exposed by incidental ingestion of soil/sediment. The remedial goal of 2.1 mg/kg for beryllium was based on carcinogenic health effects. In April 1998 USEPA withdrew the carcinogenic toxicity criteria for oral exposures to beryllium. The remedial goal for potential exposures to beryllium in soil/sediment by a older child trespasser based on noncarcinogenic effects would be 2,600 mg/kg. Since the revised remedial goal for beryllium is higher and therefore less stringent than the remedial goal presented in the FS and ROD, the revised remedial goal for beryllium does not call into question the effectiveness of the remedy.

The soil remedial goal of 5.0 for DDTR was based on potential impacts to the short-tail shrew via ingestion of soil and contaminated prey items. The toxicity data used to develop this value have not changed in the last 5 years. A site-specific soil-to-earthworm BAF was determined so this value has not

changed. Finally, the exposure parameters in the food-chain model have changed in the last 5 years. Therefore, the effectiveness of the remedy for soil has not changed in the last 5 years.

The sediment remedial goals for metals were based on the ER-M values from Long et al. (1995), which have not changed or been updated in the last 5 years. Also, because the sediment remedial goal for DDTR is based on site-specific empirical relationships between effects to benthic macroinvertebrates and DDTR concentrations, no changes can be made to this remedial goal. Therefore, the effectiveness of the remedy for sediment has not changed in the last 5 years.

The sediment remedial goal for dieldrin is based on equilibrium partitioning using site-specific TOC concentrations, the chemical-specific  $K_{oc}$  values, and the WQSV for dieldrin. The only update to the parameters used in this equation was the WQSV, which was decreased from 0.062  $\mu$ g/L (USEPA, 1993a) to 0.056  $\mu$ g/L (USEPA, 1999a). This would produce a slightly lower sediment action level. Dieldrin was only detected in one post-removal sediment sample at an estimated concentration of 0.0022 mg/kg. This value was significantly less than the sediment action level of 0.045 mg/kg, and would only decrease slightly using the updated WQSV. Therefore, the revised WQSV for dieldrin does not call into question the effectiveness of the remedy.

#### 3.5.3.2 Groundwater

The ARARs/TBCs considered during preparation of the groundwater ROD are presented in Tables 3-6 and 3-7. These ARARs/TBCs have been or will be met by implementation of the remedial action. A Land Use Control Remedial Design was completed, and controls have been implemented through the New London Instruction 5090.18C. At least yearly monitoring of Institutional Control compliance will be completed with the monitoring reports being incorporated into future five-year reviews. A groundwater monitoring program was initiated, and the results will be reported in future monitoring reports. No new human health ARARs have been promulgated since the ROD was signed in 2004 that would call into question the protectiveness of the remedy for groundwater.

## 3.5.4 <u>Site Inspection</u>

Five-year review site inspections were completed on April 4, 2006. A cursory inspection of several Site 3 features (i.e., OBDA Pond, Upper Pond, Stream 4, Site 3 – NSA, and proposed locations of four new monitoring wells for the groundwater monitoring program) was completed during the inspection. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. Photographs of the OBDA Pond and Upper Pond are provided in Appendix B. No significant issues were noted during the inspection.

# 3.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review. The status of site restoration monitoring was discussed with the Navy. Details of the site restoration monitoring are discussed in Section 3.3.3.1.

## 3.6 ASSESSMENT

The following conclusions support the determination that the remedy for the Site 3 soil and sediment OU (OU3) is protective of human health and the environment and that the remedy for the Site 3 groundwater OU, a portion of OU9, will be protective of human health and the environment upon completion.

# Question 1. Is the remedy functioning as intended by the decision documents?

- Remedial Action Performance: All contaminated soil and sediment in excess of remediation goals (Table 3-1) were excavated and disposed off site. The only exception was a small area in Stream 4, which was capped in place using concrete. The effectiveness of the OU3 remedial action and site restoration activities was monitored for 3 years. The results of the monitoring showed that restoration activities were successful and that no further actions were necessary. Groundwater monitoring was recently initiated at the site to monitor the natural attenuation of contaminants in groundwater until they reach the remedial goals presented in Table 3-2. The groundwater data will be summarized and evaluated in subsequent monitoring reports. The results of the groundwater monitoring program will be used to determine if changes in the selected remedial action are necessary in the future.
- System Operations/O&M: Issues noted during the post-construction monitoring program (e.g., invasive vegetation and deer browse) for OU3 were addressed as appropriate. For the groundwater OU, four new monitoring wells were installed to complete the monitoring well network, and five existing wells were redeveloped as part of the groundwater monitoring program. O&M activities for the monitoring wells will be required in the future.

Costs for groundwater monitoring at Site 3 over the first 5 years of the program were estimated in the FS to range from \$50,200 (Year 1) to \$15,378 (Years 2 through 5). Because the monitoring program was initiated in May 2006, actual costs were not available at the time of preparation of this report.

No O&M of the encapsulated soil at Stream 4 has been done to date. O&M activities need to be initiated at the site and continued into the future.

- *Opportunities for Optimization:* Site 3 monitoring wells not being used for the monitoring program can be abandoned. The monitoring well network can be reduced as appropriate in the future.
- Early Indicators of Potential Remedy Failure: There are no indicators of potential remedy failure.
- Implementation of Institutional Controls and Other Measures: Institutional controls associated with Site 3 are discussed in the New London Instruction 5090.18C. Controls on the area where a small amount of contaminated soil was encapsulated at Stream 4 were incorporated into the instruction. Some areas of Site 3 are fenced and access is restricted. A significant portion of the site is within designated ESQD arcs of the Area A Weapons Center; therefore, further development is not planned for the area. A Land Use Control Remedial Design for Site 3 groundwater was completed, and the controls have been implemented through the New London Instruction 5090.18C.

# Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: There have been no changes in standards or TBCs that call into question the protectiveness of the soil and sediment OU or groundwater OU remedies. As presented in Section 3.5.3, the WQSV for dieldrin decreased from 0.062 µg/L to 0.056 µg/L. None of the other standards/TBCs have changed since the ERA was conducted.
- Changes in Exposure Pathways: Because all contaminated soil and sediment with concentrations greater than remedial goals was either excavated and disposed off site or capped in place, the direct exposure pathway for human and ecological receptors to come into contact with the soil and sediment has been eliminated. This change was planned as part of the remedial action. Groundwater at Site 3 is not currently used as a drinking water source, and municipal potable water is available at the site, which would minimize the likelihood that groundwater would be used as a drinking water source in the future.
- Changes in Toxicity and Other Contaminant Characteristics: In April 1998, the USEPA withdrew the oral CSF for beryllium. In addition, the oral RfD for beryllium was lowered from 0.005 mg/kg/day to 0.002 mg/kg/day. As discussed in Section 3.5.3, the changes in the toxicity criteria for beryllium do not call into question the effectiveness of the remedy for the soil and sediment OU. None of the toxicity data for the groundwater contaminants have changed, and none of the ecological toxicity data have changed since the ERA was conducted.

- Changes in Risk Assessment Methods: Since the human health risk assessments were prepared
  USEPA has issued new guidance documents, as discussed in Section 1.4. The new guidance
  documents do not impact the conclusions of the original human health risk assessments. As
  discussed in Section 1.4, ecological risk assessment methodology has not changed significantly over
  the past 5 years.
- Expected Progress Towards Meeting RAOs: The RAOs for OU3 were met by conducting the remedial action that included excavation and off site disposal of a majority of the contaminated soil and sediment and capping in place of a small amount of contaminated soil/sediment in Stream 4. RAOs for the groundwater at Site 3, a portion of OU9, are in the progress of being met. A Remedial Design for LUCs was prepared for groundwater and was incorporated in the New London Instruction 5090.18C. A Groundwater Monitoring Plan was implemented in May 2006 to monitoring the degradation and potential migration of COCs until concentrations reach the remedial goals.

## Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

The Site 3 – NSA was discovered during the OU3 remedial action in Stream 5 and further investigated during the BGOURI DGI in 2002. Sampling and analysis conducted during the investigation indicated that the only COC for the area was petroleum. Because petroleum was the only concern at the site, it was excluded from further evaluation under CERCLA. The Navy plans to complete a removal action to address the area in 2007.

## 3.7 ISSUES

The following deficiencies were identified during this review:

- New London Instruction 5090.18C was issued in 2006 and includes information regarding the
  contaminated soil/sediment capped in place in Stream 4 and the latest information from the Land Use
  Control Remedial Design for Site 3 groundwater. However, an ESD needs to be prepared for the
  contaminated soil/sediment capped in place in Stream 4.
- Maintenance of the existing monitoring wells was not completed, and a monitoring well abandonment program was not prepared or implemented.

## 3.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and review, the following recommendations are made for Site 3.

- Continue implementation of the Groundwater Monitoring Plan
- Conduct the removal action for Site 3 NSA
- Continue to enforce the New London Instruction 5090.18C
- Maintain the existing monitoring well network and/or properly abandon unnecessary monitoring wells
- At least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews
- Prepare and issue an ESD for the capped wastes at Stream 4 that addresses CERCLA requirements

Follow-up actions should be completed by the Navy in a timely manner to address the recommendations.

#### 3.9 PROTECTIVENESS STATEMENT

The remedy implemented for soil and sediment at Site 3 (OU3) is protective of human health and the environment. Although it is not required under CERCLA, an RA is planned for the Site 3 – NSA. It is anticipated that, when the soil associated with the NSA is addressed by a removal action, the remedial actions completed for the soil and sediment OU will be completely protective of human health and the environment.

The remedy for groundwater at Site 3 is expected to be protective of human health and the environment. The groundwater OU for Site 3 will be addressed with institutional controls and monitoring. There are no immediate threats to human health or the environment from the OU (i.e., groundwater is not currently used as a drinking water source). Implementation of institutional controls and monitoring will maintain the effectiveness of the remedy into the future.

**TABLE 3-1** 

## SUMMARY OF REMEDIAL GOALS FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Contaminant of	Medium of Concern			
Concern	Soil	Sediment		
DDTR	5.0 mg/kg	2.0 mg/kg		
Dieldrin	Not a COC	0.045 mg/kg		
Arsenic	Not a COC	6.1 mg/kg		
Beryllium	Not a COC	2.1 mg/kg		
Cadmium	Not a COC	9.6 mg/kg		
Lead	Not a COC	218 mg/kg		
Zinc	Not a COC	410 mg/kg		

## SUMMARY OF REMEDIAL GOALS FOR SITE 3 GROUNDWATER SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Contaminant of Concern	Remedial Goal for Protection of Future Potential Receptors <sup>(1)</sup>
Volatile Organic Compounds	
Trichloroethene	5 μg/L
Vinyl chloride	2 μg/L
Semi-volatile Organic Compounds	
Hexachlorobenzene	1 μg/L

Future potential receptors consist of residents living at the site who may use groundwater as a source of potable water. Human health remedial goals are based on federal and State of Connecticut drinking water/groundwater quality standards.

## CHEMICAL-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSE/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
FEDERAL				
Water Quality Criteria for DDT and Metabolites (EPA 440-80-038), 1980	NA	TBC	Provides criteria for assessing toxicity of DDT and metabolics to aquatic organisms.	DDTR-contaminated soil/sediment was either excavated, removed, and replaced with uncontaminated material or capped. Remaining soil/sediment provides no source of contamination to surface waters and poses no hazard to potential aquatic receptors. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Technical Basis for deriving Sediment Quality Criteria for Non-Ionic Organic Contaminants for Protection of Benthic organisms by Using Equilibrium Partitioning (EPA-822-R-93-011), 1993	NA	TBC	Guidance for estimating cleanup goals for sediment contamination.	Contaminated sediment was either excavated, removed, and replaced with uncontaminated material or capped. Remaining sediment poses no hazard to potential receptors. Removal of contaminated sediment achieved protection of receptors of concern; therefore, this requirement is no longer applicable.
National Oceanographic and Atmospheric Administration (NOAA) Incidence of Adverse Biological Effects within Ranges of Chemical Concentration in Marine and Estuarine Sediments (Long et. al., 1995)	NA	TBC	Guidance on concentration ranges of contaminants in sediment that would rarely or more likely to have adverse effects. Findings comparable with fresh-water sediments.	Contaminated sediment was either excavated, removed, and replaced with uncontaminated material or capped. Remaining sediment poses no hazard to potential receptors. Remedial actions achieved protection of receptors of concern; therefore, this requirement is no longer applicable.

## CHEMICAL-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSE/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
FEDERAL (Continued)				
Cancer Slope Factors (CSFs)	NA	TBC	These are guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	Contaminated sediment was either excavated, removed, and replaced with uncontaminated material or capped Remaining sediment poses no hazard to potential receptors. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Reference Doses (RfDs)	NA	TBC	These are guidance values used to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	Contaminated soil/sediment was either excavated, removed, and replaced with uncontaminated material or capped. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
STATE OF CONNECTICUT				
Soil Remediation Standards	RCSA § 22a-133k- 1 through 2	Applicable	Regulations specify remediation standards for direct exposure to soil and sediments.  Regulations also specify groundwater protection standards for contaminated soil in areas with a state groundwater classification of GB.	Contaminated soil/sediment was either excavated, removed, and replaced with uncontaminated material or capped. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy. The groundwater aquifer is expected to meet the standards for the GB groundwater classification after the completion of the groundwater OU activities.

## LOCATION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 3

#### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Clean Water Act, Section 404	33 USC 1344; 40 CFR Part 230 and 33 CFR Parts 320-323	Applicable	These rules regulate the discharge of dredge and fill materials in wetlands and navigable waters. Such discharges are not allowed if practicable alternatives are available.	Remedial action included dredging of soil and sediment from contaminated wetlands and replacement/restoration with uncontaminated material. Measures were taken to minimize adverse effects and to replace or restore protected wetland functions and values.  Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Executive Order 11990 RE: Protection of Wetlands	Executive Order 11990, 40 CFR Part 6, Appendix A	Applicable	This order requires Federal agencies to take action to avoid adversely impacting wetlands wherever possible, to minimize wetlands destruction and to preserve the values of wetlands, and to prescribe procedures to implement the policies and procedures of this Executive Order.	Remedial action included dredging of soil and sediment from the contaminated wetlands and replacement/restoration with uncontaminated material. Measures were taken to minimize adverse effects and to replace or restore protected wetland functions and values. Wetlands restoration was completed according to the Wetlands Restoration Plan. The substantive requirements of the wetlands ARARs have been met. Changes in remedial goals for soil and sediment as related to wildlife and benthic organisms are presented in Section 3.5.3. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy

## LOCATION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 3

#### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Fish and Wildlife Coordination Act	16 USC Part 661 et. seq., 40 CFR 122.49	Applicable	This act protects fish and wildlife when Federal actions result in control or structural modification of a natural stream or body of water.	Remedial action included dredging of soil and sediment from the contaminated wetlands and replacement/restoration with uncontaminated material. Measures were taken to minimize adverse effects on fish and wildlife. Changes in remedial goals for soil and sediment as related to wildlife and benthic organisms are presented in Section 3.5.3. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy
Coastal Zone Management Act	16 USC Parts 1451 et. seq.	Applicable	Requires that any actions must be conducted in a manner consistent with state approved management programs.	Dredging, filling, regrading, and restoration of vegetation were completed. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy
Executive Order 11988 RE: Floodplain Management	Executive Order 11988	Applicable	This order requires federal agencies to evaluate the potential effects of actions it may take within a designated 100-year floodplain of a waterway to avoid adversely impacting floodplains whenever possible.	Dredging, filling, regrading, and restoration of vegetation were completed. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy

# LOCATION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 3 OF 3

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Inland Wetlands and Watercourses	CGS § 22a-37 thru 45, RCSA § 22a-39-1 through 15	Applicable	These rules regulate all activities in wetlands and watercourses.	Contaminated soil and sediment were dredged from wetlands and watercourses, which were restored using uncontaminated material. Wetlands restoration was successfully completed in accordance with the Wetlands Restoration Plan. Changes in remedial goals for soil and sediment as related to wildlife and benthic organisms are presented in Section 3.5.3. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy
Coastal Management	CGS §§22a-92 and 94	Applicable	Federal facilities are required to file a coastal zone consistency determination under these rules, which includes the goal that development, preservation, or use of land and water resources of a coastal area proceed without significantly disrupting the natural environment.	Contaminated soil and sediment were removed from areas within the coastal zone, which were restored using uncontaminated material. The substantive requirements of the Connecticut standards were met to address the alteration of the coastal zone. Restoration of vegetation has been completed. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy
CT Endangered Species Act	CGS § 26-303 through 314	Relevant and Appropriate	Regulates activities affecting state-listed endangered or threatened species or their critical habitat.	Dredging, filling, regrading, and restoration of vegetation have been completed. Because waste was capped inplace at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy

## ACTION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 3

## **FEDERAL**

FEDERAL				
Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES)	33 USC 1342; 40 CFR 122 through 125	Applicable	These standards govern the discharge of water into surface waters.	Surface water removed prior to dredging, along with water from the sediment/soil dewatering process, wa treated by filtration and carbon adsorption to meet discharge criteria according to substantive requirements of NPDES. Because waste was cappe in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
STATE OF CONNECTICUT				
Water Pollution Control	RCSA § 22a-430-1 through 8	Applicable	These rules regulate water discharge to surface water.	Surface water removed prior to dredging, along with water from the sediment/soil dewatering process, was

Water Pollution Control	RCSA § 22a-430-1 through 8	Applicable	These rules regulate water discharge to surface water.	Surface water removed prior to dredging, along with water from the sediment/soil dewatering process, was treated by filtration and carbon adsorption in compliance with these regulations. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Water Quality Standards	CGS 22a-426	Applicable	Connecticut's Water Quality Standards establish specific numeric criteria, designated uses, and anti-degradation policies for groundwater and surface water.	Surface water removed prior to dredging, along with water from the sediment/soil dewatering process, was treated by filtration and carbon adsorption in a manner that is consistent with the anti-degradation policy in the Water Quality Standards. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.

## ACTION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 3

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Hazardous Waste Management: Generator and Handler Requirements, Listing and Identification	RCSA § 22a-449(c) 100-101	Applicable	Connecticut is delegated to administrate the federal RCRA statute through its State regulations. These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference.	Hazardous waste determinations were performed on all contaminated soils/sediments excavated to determine that levels of regulated constituents do not exceed applicable limits. Also, wastes produced from surface water and dewatering treatment were tested to determine whether levels of certain regulated constituents (lead, mercury, heptachlor, etc.) exceed TCLP limits. Any contaminated soils/sediments that exceeded applicable limits were managed in accordance with requirements of these regulations. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Hazardous Waste Management: Generator Standards	RCSA § 22a-449(c)-102	Applicable	This section establishes standards for various classes of generators. The standards of 40 CFR 262 are incorporated by reference.	Surface water treatment residues (spent filtration media and activated carbon) were tested for hazardous characteristics during remediation.  Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Hazardous Waste Management: TSDF Standards	RCSA § 22a-449 (c) 104	Applicable	This section establishes standards for treatment, storage, and disposal facilities. The standards of 40 CFR 264 are incorporated by reference.	Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.

## ACTION-SPECIFIC ARARS AND TBCs FOR SITE 3 SOIL AND SEDIMENT SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 3 OF 3

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
Air Pollution Control	RCSA § 22a-174 1-20	Applicable	These regulations require permits to construct and operate specified types of emission sources and contain emission standards that must be met prior to issuance of a permit. Pollutant abatement controls may be required. Specific standards pertain to fugitive dust (18b), and control of odors (23).	Emission standards for fugitive dust from excavation and restoration operations were met with dust control measures. Odors/emissions from the dewatering piles were managed to comply with these standards. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Water Diversion Policy Act	RCSA § 22a-377(b)	Relevant and Appropriate	These rules regulate a wide variety of water diversions.	Surface water diversions during remediation were conducted using best management practices.  Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.
Connecticut Guidelines for Soil Erosion and Sediment Control	CT Council on Soil and Water Conservation	TBC	Technical and administrative guidance for development, adoption and implementation of erosion and sediment control program.	Guidelines were followed during remediation.  Dredging, filling, regrading, and restoration of vegetation have been completed. Because waste was capped in place at Stream 4, these requirements are applicable to the future operation and maintenance of the remedy.

## CHEMICAL-SPECIFIC ARARS AND TBCs FOR SITE 3 GROUNDWATER SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

## **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
Cancer Slope Factors (CSFs)	Not Applicable	TBC	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and the monitoring will track contaminant migration and degradation of contaminants until concentrations are less than acceptable levels.
Reference Doses (RfDs)	Not Applicable	TBC	These are guidance values used in risk assessment to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and the monitoring will track contaminant migration and degradation of contaminants until concentrations are less than acceptable levels.

Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k - 1 thru 3	Applicable	This regulation provides specific numerical cleanup criteria for contaminants in groundwater. Requirements are based on groundwater in the area being classified by the State as GB.	The remedy of land use controls and monitoring complies with ARAR. Land use controls will prevent exposure to and use of contaminated groundwater.  Monitoring will track the location, migration, and degradation of contaminants until concentrations are less than acceptable levels.

## ACTION-SPECIFIC ARARS AND TBCs FOR SITE 3 GROUNDWATER SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

## **FEDERAL**

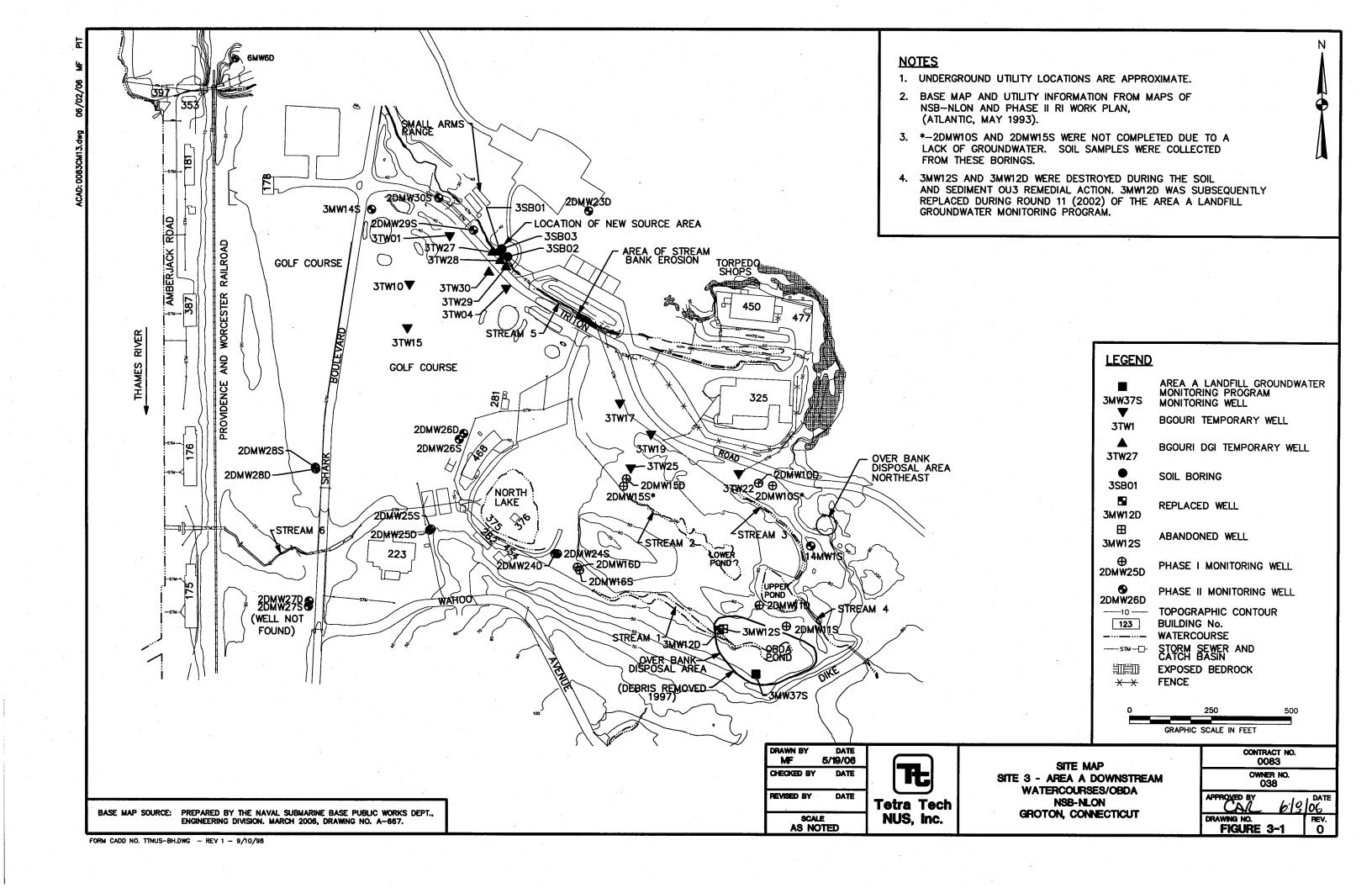
Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
SDWA MCLs	42 USC 300f et. seq. 40 CFR Parts 141 to 143	Relevant and Appropriate	MCLs established under this act are health-based limits for certain chemical substances in drinking water. Site groundwater is not a current or planned future drinking water source. However, in the future, the site groundwater could be used as a potable water supply.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and monitoring will track the migration and degradation of contaminants until concentrations are less than acceptable levels.
Clean Water Act, Section 403, Pretreatment Regulations	Section 403	Applicable	General pretreatment requirements for discharge to a publicly-owned treatment works.	Groundwater extracted during groundwater monitoring activities is being tested and disposed off site. Discharge to a publicly-owned treatment works may be considered in the future for disposal of the groundwater and these requirements will be met if it is determined to be applicable.

## ACTION-SPECIFIC ARARS AND TBCs FOR SITE 3 GROUNDWATER SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a- 449(c) 100-101	Applicable	Connecticut is delegated to administer the Federal Resource Conservation and Recovery Act statute through its state regulations. These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference.	Waste generated during the installation of monitoring wells and monitoring activities under the selected remedy was characterized for disposal and determined to be nonhazardous. This requirement is applicable during future well installation activities.
Hazardous Waste Management: Treatment, Storage, or Disposal Facility Standards	RCSA § 22a- 449(c) 104	Applicable	These sections establish standards for treatment, storage, and disposal facilities. The standards of 40 CFR 264 are incorporated by reference.	Waste generated during the installation of monitoring wells and monitoring activities under the selected remedy was characterized for disposal and determined to be nonhazardous. This requirement is applicable during future well installation activities.
Water Quality Standards	CGS 22a-426 (Connecticut General Statutes)	Applicable	These standards specify Connecticut WQSs, classifications of water of the state, and anti-degradation policies for surface water and groundwater. Groundwater at the site is classified as GB.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and monitoring will track the migration and degradation of contaminants until concentrations are less than acceptable levels.

## DEFICIENCIES IDENTIFIED FOR SITE 3 - AREA A DOWNSTREAM WATECOURSES/OBDA NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Deficiency	Effects Prot	Effects Protectiveness	
	Current	Future	
Completion of ESD for soil/sediment at Stream 4	N	N	
Maintenance/abandonment of monitoring wells	Y	Y	



## 4.0 SITE 6 – DEFENSE REUTILIZATION AND MARKETING OFFICE (OU2)

This 5-year review of Site 6 - DRMO is required by statute because hazardous substances, pollutants, or contaminants remain on site that do not allow for unlimited use or unrestricted exposure. A time-critical removal action (TCRA) completed at the DRMO in January 1995 focused on the removal of soil contaminated with lead, PAHs, and PCBs from the northern half of the DRMO. After completion of the removal activities, the area was backfilled with clean borrow material, capped with a geosynthetic clay/geotextile layer, and overlaid by gravel/asphalt. An interim ROD addressing the contaminated soil and groundwater (OU2) and the impacts on the surface water of the Thames River was completed in March 1998 (B&RE, 1998b). Groundwater monitoring has been conducted for 7 years, and annual O&M landfill inspections have been completed for 3 years as part of the remedy selected in the interim ROD. Data collected during the monitoring and inspection programs are evaluated within this report. A final ROD for soil and groundwater at Site 6 was signed in December 2006 (Navy, 2006). The final remedy selected for Site 6 is similar to the one selected in the interim ROD and it includes institutional controls and monitoring.

#### 4.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 6 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
DRMO used as a landfill and waste burning area.	1950 to 1969
Final IAS completed.	March 1983
Phase I RI completed.	August 1992
Draft FFS completed.	March 1994
TCRA completed.	January 1995
Action Memorandum completed.	March 1995
Final Report for IRA completed.	September 1995
Phase II RI completed.	March 1997
Proposed Plan issued.	September 1997
Public Meeting conducted.	September 1997
Groundwater Monitoring Plan finalized.	February 1998
Final Interim ROD for OU2 signed.	March 1998
Groundwater Monitoring Program initiated.	April 1998
Year 1 Annual GMR completed.	November 1999
Year 2 Annual GMR completed.	October 2000
First Five-Year Review performed.	December 2001
Year 3 Annual GMR completed.	March 2002

Event	Date
Draft Final O&M Manual – Volumes I, III, IV, and V completed.	September 2002
SOPA (ADMIN) New London Instruction 5090.18B completed.	February 2003
Draft O&M Manual – Volume II completed.	March 2003
Year 4 Annual GMR completed.	August 2003
2003 Annual LIR completed.	November 2004
Year 5 Annual GMR completed.	December 2004
2004 Annual LIR completed.	September 2005
Year 6 Annual GMR completed.	August 2005
2005 Annual LIR completed.	October 2005
Draft Year 7 Annual GMR completed.	January 2006
Final O&M Manual – Volumes I, II, III, IV, and V completed.	January 2006
Final ROD for OU2 signed.	December 2006
SOPA (ADMIN) New London Instruction 5090.18C issued.	December 2006

#### 4.2 BACKGROUND

The DRMO (Site 6) is located adjacent to the Thames River in the northwestern section of NSB-NLON. The site's location relative to other IR sites is shown on Figure 1-2. The site is located between a bedrock outcrop that runs roughly parallel to the Providence and Worchester Railroad to the east and the Thames River to the west. The site covers approximately 3 acres of land gently sloping toward the Thames River. A majority of the site is paved with an asphalt layer, and the site features buildings, a weighing scale, and miscellaneous storage piles. Figure 4-1 displays the general site arrangement. Currently, the DRMO is used as a storage and collection facility for items such as computers, file cabinets, and other office equipment to be sold during auctions and sales held periodically during the year.

From 1950 to 1969, the DRMO was used as a landfill and waste-burning area. Non-salvageable waste items including construction materials and combustible scrap were burned along the Thames River shoreline, and the residue was pushed to the shoreline and partially covered.

During the review of archived aerial photographs of the DRMO area, the 1934 photographs show fill in the southern portion of the site. Fill for bulkheads and docks south of the DRMO did not exist at that time. Aerial photographs from 1951 show the land in its present configuration, except for the northwestern portion, which was not filled at that time.

During a site inspection on September 30, 1988, it was noted that metal and wood products were stored throughout most of the site. Buildings 355 and Building 479 are located in the southern, paved portion of the site and are primarily used for storage. A large scrap yard is located north of Building 479.

Building 491, located in the northern, unpaved portion of the site was used to store miscellaneous items including batteries. Metal scrap bailing operations are performed adjacent to Building 491 on a gravel surface. Building 491 formerly housed a battery-acid-handling facility. Submarine batteries were previously stored in the southeastern portion of the site, adjacent to the railroad tracks. No evidence of leaks was observed. An in-ground rubber-lined tank and associated pumping facilities were noted on the site drawings. DRMO personnel indicated that the tank actually may have been installed directly adjacent to the building to the east.

A Conforming Storage Facility Report (GZA, 1988) for the DRMO was prepared in 1988 as a requirement for the siting of a hazardous waste storage facility in the northern portion of the DRMO. The study performed for the report indicated the presence of PCBs and other contaminants at the DRMO.

A two-phase RI was conducted to determine the nature and extent of contamination at the DRMO. Phase I RI field activities were conducted from 1990 to 1992 (Atlantic, 1992) and included test borings, monitoring well installation, and soil, surface water, and groundwater sampling. Some evidence of the former landfill was encountered during drilling, including wood fragments, brick, and metal but predominately earth fill material. The thickness of the fill varied from 0 to 8 feet. Human health risks were determined for Navy workers based on exposure to PCBs, PAHs, and beryllium in surface soil and lead in soil in the northern portion of the site. In addition, groundwater quality exceeded drinking water standards; however, no drinking water wells were within the affected area, nor could they be due to the proximity of the brackish Thames River. Risks to fish in the Thames River estuary were determined to be low from contaminants in groundwater discharged from the site. It was recommended that the site proceed to the FS phase. It was also recommended that specific health and safety provisions be made for all subgrade construction projects at the site. The risks were primarily related to incidental oral and dermal exposure of site workers to contaminated surface soils (Atlantic, 1992).

A field investigation in support of the draft FFS was performed at the DRMO in October 1993 to better define the extent of soil contamination. Surface and subsurface soil samples were collected from 17 borings, and one of the borings was completed as a monitoring well. The soil borings indicated that the depth of fill ranged from approximately 1.5 to 20 feet. Fill material consisted of wood, glass, and metal scrap in a predominately sand and gravel matrix (Atlantic, 1994a).

A TCRA was completed in January 1995. Initial activities associated with the TCRA at the site included preexcavation sampling and analysis focused on better defining the limits of PCB-contaminated soils in the areas to be excavated. Confirmatory soil sampling and analysis were conducted on the sidewalls of the excavations. Human health and ecological risks associated with the soil left in place after the removal action were evaluated during the Phase II RI. Additional details of the TCRA are provided in Section 4.3.2.1.

Phase II RI field activities were conducted from 1993 to 1995 (B&RE, 1997a) and included installation of five new monitoring wells, two rounds of groundwater sampling, and subsurface soil sampling. The Phase II RI concluded that the majority of contaminated soil had been removed during the TCRA, the groundwater was not significantly affected, and that relatively low human health and ecological risks were associated with the DRMO. The Phase II RI recommended that NFA be conducted at the DRMO for soil and groundwater and that groundwater monitoring be conducted to verify that significant contamination is not leaching to groundwater.

An FS (B&RE, 1997f) was completed for soil and groundwater at the DRMO, and the selected remedial alternative (institutional controls and monitoring) was documented in an Interim ROD (B&RE, 1998b).

O&M of the cover system at the DRMO is being performed in accordance with the final O&M Manual for Installation Restoration Program Sites (TtNUS, 2006a). A groundwater monitoring program began at the DRMO in April 1998 in accordance with the Groundwater Monitoring Plan (B&RE, 1998a) and is ongoing. The results of the program are being used to verify the effectiveness of the cap in reducing infiltration and leaching of contaminants and to confirm that contamination is not migrating from soil to groundwater and eventually to the Thames River. To date, the monitoring results have not shown any significant contaminant migration issues.

Based on the positive results of the monitoring program, a final ROD for Site 6 was signed in December 2006 (Navy, 2006). The selected remedial alternative is similar to the interim remedy selected in 1998. The remedy includes institutional controls, monitoring, and five-year reviews.

#### 4.3 REMEDIAL ACTIONS

A TCRA was completed in January 1995 to remove soil containing elevated concentrations of lead, PAHs, and PCBs from the northern half of the DRMO. Additional soil and groundwater sampling was conducted during the Phase II RI after the TCRA. Based on the results of the Phase II RI, NFA was recommended for the DRMO. An Interim ROD (B&RE, 1998b) was signed for Site 6 soil and groundwater (OU2). Institutional controls and monitoring were selected as the remedial action in the Interim ROD. By implementing institutional controls and maintaining the existing cap [asphalt and geosynthetic clay liner (GCL)], the Navy will protect potential human receptors from adverse health effects of exposure to the underlying contaminants. By implementing monitoring, the Navy will verify that contaminants in the soil are not migrating to the Thames River through the groundwater.

## 4.3.1 Remedy Selection

#### 4.3.1.1 TCRA

Several previous investigations at the DRMO confirmed that a release of contaminants into the environment had occurred and that contamination remained at the site. Moderate concentrations of VOCs and pesticides and higher concentrations of PCBs, SVOCs, and heavy metals were detected.

Target cleanup levels were developed in the Action Memorandum (Atlantic, 1995b) to ensure the following:

- Limited opportunity for individuals to encounter hot spots where contaminants may be present at elevated concentrations.
- Overall human health risks associated with activities at the DRMO are less than acceptable levels.

The proposed TCRA at the DRMO consisted of excavation and off-site disposal of contaminated soil hot spots and an in-ground spent acid tank at a RCRA landfill, followed by the placement of an impervious cap throughout all unpaved areas of the site. Soil PRGs used to identify hot spots included:

- Lead 500 mg/kg
- PCBs 10 mg/kg
- Carcinogenic polycyclic aromatic hydrocarbons (CPAHs) 100 mg/kg

At the DRMO, accessible soil was determined to be soil from the ground surface to a depth of 3 feet. After the tank and hot spot removals were completed, the site was to be covered by an impervious bentonite geocomposite liner between layers of nonwoven geotextile and covered with 12 inches of compacted crushed stone. Access to the site would continue to be restricted via perimeter fencing and security procedures (Atlantic, 1995b).

#### 4.3.1.2 Post TCRA

An FS for the DRMO was completed in response to the Phase II RI. The FS evaluated several remedial alternatives for the DRMO. The recommended interim remedy of institutional controls and monitoring was presented in the Proposed Plan (B&RE, 1997e) and was formally selected in the ROD for the soil and groundwater OU (OU2) that was signed in March 1998. A final ROD was signed for the site in December 2006 (Navy, 2006). The final remedy includes institutional controls, monitoring, and five-year reviews.

Based on information relating to types of contaminants, environmental media of concern, and potential exposure pathways, RAOs were developed to aid in the development of alternatives. The following RAOs were developed to mitigate existing and future potential threats to public health and the environment:

- Prevent unacceptable risks to human receptors from exposure to contaminated soil under either a
  current industrial or future (although unlikely) residential land use scenario through either institutional
  controls and/or removal/treatment/disposal.
- Prevent unacceptable risk to ecological receptors in the Thames River from potential migration of contaminants.

The final remedy for the DRMO was selected to meet the RAOs. The selected remedy, as defined in the ROD, consisted of the following components:

- Institutional controls will include maintenance of the existing cap, limitations on site access, restrictions on land use, and monitoring and enforcement of compliance with land use restrictions. Maintenance of the existing asphalt and GCL cap will consist of regular inspections to assess the integrity of the asphalt and GCL cap. Items to be inspected and maintained include fencing, signs, asphalt cap, catch basin, culvert outlet, riprap, and monitoring wells. Record of Findings, Plan of Action, and Completion Reports will be prepared as needed based on each annual inspection. Periodic repair and replacement of the asphalt layer, monitoring wells, and any other remedy components will be performed as needed. Land use restrictions for the DRMO will limit activities such as excavation, drilling, residential use of property, and excessive vehicular use. While the area is under jurisdiction of the Navy, there shall be a Base Instruction [i.e., NSB-NLON Installation Restoration Site Use Restrictions Instruction document (5090.18C) (Navy, 2006b)] or other Navy mechanism that documents the restriction on land use and controls use of the site. The Navy will, at least annually, inspect the area and document compliance with the land use restrictions. This documented compliance will be included in future Five-Year Reviews of the site. If the site is ever transferred from Navy control, the Navy will create a deed for the property that will include the land use restrictions. The restrictions will meet all applicable State property law standards for placing environmental land use restrictions on contaminated property. Although the Navy may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Navy shall retain the ultimate responsibility for remedy integrity.
- Groundwater monitoring to be performed in accordance with Volume II GMP of the O&M Manual (TtNUS, 2006a). Samples collected under the new monitoring program will be analyzed for VOCs,

SVOCs, PAHs, and metals (total) to evaluate whether contamination is migrating to the Thames River and potentially causing adverse effects to the ecological receptors. As appropriate, the monitoring program may be revised based on the analytical data collected from the previous sampling events. Data will be evaluated to determine the need for additional remedial action at the site or the need to modify the monitoring program.

 A site review will be conducted every 5 years for as long as contamination onsite poses a CERCLA risk to evaluate the site status and determine whether further action is necessary.

#### 4.3.2 Remedy Implementation

#### 4.3.2.1 TCRA

OHM Remediation Services Corporation (OHM), the Navy's RAC, completed a TCRA at the DRMO in January 1995 (OHM, 1995a). During the TCRA, soils containing concentrations of lead, PAHs, and PCBs in excess of PRGs were excavated and removed from the northern half of the DRMO. The PRGs used for soil screening of lead, PCBs, and PAHs were 500 mg/kg, 10 mg/kg, and 100 mg/kg, respectively. Excavation extended to a maximum depth of approximately 3 feet below the ground surface or to the water table. Approximately 4,700 tons of soil were excavated and transported to a RCRA landfill located in Grand View, Idaho. Residual contamination in excess of PRGs remained after excavation was completed because the excavation was limited to 3 feet by the shallow water table and because of exceedances of the allotted time for the project (B&RE, 1997e). Additionally, a steel-walled, spent-acid-storage tank was excavated, cut into manageable pieces, and disposed off site with the contaminated soil.

The excavated area was backfilled with clean borrow material from an off-site location. A cap consisting of woven geotextile fabric, a GCL, and nonwoven geotextile fabric was installed. Approximately 12 inches of crushed stone and 3 inches of asphalt were placed over the clay/geotextile cover. This cap does not meet RCRA Title C requirements. The remaining (unpaved) portion of the DRMO was also upgraded via placement of an asphalt layer. The total cost of the TCRA was approximately \$2,500,000.

### 4.3.2.2 Post TCRA

Groundwater monitoring for the DRMO began in April 1998, and results were included in the Interim Groundwater Monitoring Report (B&RE, 1998e). Three new monitoring wells (6MW9S, 6MW10S, and 6MW10D) were installed in accordance with the DRMO Groundwater Monitoring Plan (B&RE, 1998a) during the field investigation activities. Further details of the long-term monitoring and O&M are discussed in Section 4.3.3.

To meet the land use control requirements in the interim ROD, the Navy prepared and implemented an instruction [i.e. SOPA (ADMIN) New London Instruction 5090.18B (Navy, 2003)] to restrict use at IR sites at NSB-NLON. The instruction defines the Navy's policy regarding ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites. To meet the requirements in the final ROD, the navy prepared and implemented SOPA (ADMIN) New London Instruction 5090.18C (Navy, 2006).

Access to Site 6 is restricted. A security fence prevents on-base access from Amberjack Road. Building 397 serves as the DRMO office, where personnel must receive permission for access to the area. A sign located at the front gate warns personnel not to dig at the DRMO. North of the DRMO, another fence deters trespassers from coming onto NSB-NLON. To the east, the site is bounded by an active railroad line and a fence is also located between the railroad line and the DRMO. To improve security, a fence was installed in 2006 along the Thames River from the DRMO office to the northern boundary of the DRMO where it connects with existing fencing. This fencing was added to deter trespassers from accessing the DRMO site from the Thames River.

### 4.3.3 System Operations/Operation and Maintenance

### 4.3.3.1 Monitoring Program

The Navy implemented a groundwater monitoring program at Site 6 in April 1998. The results of the program are being used to verify the effectiveness of the cap installed as part of the TCRA to reduce precipitation infiltration and leaching of contaminants and to confirm that contamination is not migrating through soil into groundwater and ultimately discharging to the Thames River. Sampling has been completed at the site in accordance with the final Groundwater Monitoring Plan for DRMO (B&RE, 1998a) from the initiation of the program through 2005. Future sampling activities at the site will be completed in accordance with Volume II – Groundwater Monitoring Plan of the O&M Manual (TtNUS, 2006a).

Monitoring at the DRMO was initially conducted quarterly, and during Year 4, the monitoring frequency was reduced to semi-annually. During Year 5, the monitoring frequency was further reduced to annually. Groundwater samples collected under the original monitoring plan were analyzed for VOCs, SVOCs, pesticides/PCBs, and metals (total and dissolved). Samples collected under the new monitoring program will be analyzed for VOCs, SVOCs, PAHs, and metals (total).

Seven annual reports (TtNUS, 1999g; TtNUS 2000a; TtNUS, 2002b; TtNUS, 2003d; ECC, 2004f; EEC, 2005g; and ECC, 2006a) have been issued that summarize the results of the monitoring program. The annual reports include a thorough evaluation of each year of data collected under the program.

Numerous round-specific reports have also been prepared to document the results of the monitoring program. The round-specific reports provide a brief screening-level assessment of the sampling round data. All of the monitoring reports have been submitted to the USEPA and CTDEP for review and comment. The results of the monitoring program during this five-year review period are discussed in Section 4.5.2.1.

### 4.3.3.2 Operation and Maintenance

The Navy issued a draft O&M Manual for the IR Program Sites at NSB-NLON, which included the DRMO, in September 2002 (TtNUS, 2002c). Volume IV of the five-volume manual included site-specific instructions for O&M activities and an inspection checklist for the DRMO. Due to an extended comment resolution period, O&M inspections of the DRMO were conducted from 2003 through 2005 (3 years) based on the draft O&M Manual. The O&M Manual was finalized in 2006 (TtNUS, 2006a), and it will provide the basis for future O&M activities at DRMO.

The O&M process for the site includes annual inspections, reporting of results, and correcting any identified problems. The findings of the inspections are documented in the field on inspection checklists and then summarized in Annual LIRs (ECC, 2004c; ECC, 2005j; and ECC, 2005n). The inspections of the landfill focused on institutional controls, the asphalt cap, stormwater features, and monitoring wells. Deficiencies noted during the inspections are addressed through the preparation of a Plan of Action and then executing the Plan of Action. Typically, the inspections are conducted in the fall, and corrective actions are completed during the following summer. The results of the three inspections conducted during this five-year review period are discussed in Section 4.5.2.2.

#### 4.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the DRMO. The recommendations from the First Five-Year Review Report (TtNUS, 2001c) are provided below along with the actions that were taken to address the recommendations.

Prepare and implement an O&M plan for the DRMO to address the noted deficiencies.

A draft O&M Manual for the IR Program Sites at NSB-NLON, which included the DRMO, was issued
on September 2002. Due to an extended comment resolution period, O&M activities were conducted
from 2003 through 2005 (3 years) based on the draft O&M Manual. The O&M Manual was finalized
in 2006 and will provide the basis for future O&M activities at the DRMO.

## An area of possible settlement was discovered in the asphalt

 No documentation is available that indicates any action was taken to repair the area of settlement found during the first five-year review approximately 50 feet southwest of Building 491. The depression is located along the line of the large crack that was repaired at this same location.

Monitoring wells and dedicated sampling equipment have not been maintained and are in need of maintenance and/or repair.

Limited maintenance has been performed on the monitoring wells located at the DRMO. The
 6MW11D road box has been repaired and the associated depression filled with cold patch.

Continue the groundwater monitoring program, but optimize the sampling frequency, monitoring well network, and analytical parameter list.

- By comparing the original Groundwater Monitoring Plan (B&RE, 1998a) to the new plan included in Volume IV of the O&M Manual (TtNUS, 2006a), the following steps have been taken to optimize the monitoring program at the DRMO:
  - The sampling frequency of the monitoring program has been reduced from quarterly to annually.
  - 2,3,3',4,5,6-hexachlorobiphenyl, pesticides, PCBs, and dissolved metals have been removed from the analytical parameter list.
  - Groundwater sampling at 3 of the 10 monitoring wells (6MW2D, 6MW10D, and 6MW11D) has been eliminated from the monitoring program.
  - The SWPC criterion for phenanthrene was corrected.

#### Continued enforcement of New London Instruction 5090.18.

- The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Instruction 5090.18B). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON.
- The instruction has been followed by personnel at NSB-NLON, and no disturbances of the cap at the DRMO have occurred.

<u>Using the results of 3 years of groundwater monitoring, determine if a final ROD for all media at the DRMO can be prepared.</u>

 The Navy prepared and signed a final ROD for Site 6 in December 2006. The results of 7 years of groundwater monitoring were used to support selection of the final remedy of institutional controls and monitoring.

#### 4.5 FIVE-YEAR REVIEW FINDINGS

### 4.5.1 <u>Document Review</u>

The documents reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

Year 3 Annual GMR completed.	March 2002
Year 4 Annual GMR completed.	August 2003
2003 Annual LIR	November 2004
Year 5 Annual GMR completed.	December 2004
2004 Annual LIR	September 2005
Year 6 Annual GMR completed.	August 2005
2005 Annual LIR	October 2005
Draft Year 7 Annual GMR completed.	January 2006
Final O&M Manual – Volumes I, II, and IV	January 2006
SOPA (ADMIN) New London Instruction 5090.18C	December 2006

## 4.5.2 Data Review

## 4.5.2.1 Monitoring Data Review

Groundwater monitoring is being conducted as part of post-closure activities associated with Site 6 to evaluate the effectiveness of the remedial action. The monitoring program was designed to determine the following:

- The effectiveness of the remedial action in preventing the migration of COPCs at concentrations
  greater than monitoring criteria to underlying groundwater and ultimately to surface water in the
  adjacent Thames River.
- The effectiveness of the remedial action in eliminating health risks.
- Whether the criteria used for evaluating the data have been met.
- Whether a groundwater plume exists and/or interferes with any existing use of groundwater.

The ultimate goal of the monitoring program is to show compliance with the selected monitoring criteria for those COPCs migrating or having the potential to migrate from the site. The screening criteria used for data evaluation are a combination of site-specific SWPC, CTDEP Volatilization Criteria, Connecticut WQSs, federal AWQCs, and background groundwater concentrations. In the future, federal AWQC will not be considered as screening criteria.

Data from Years 3 through 7 of the monitoring program are presented and evaluated in this Second Five-Year Review. The results of Years 1 and 2 of the program were presented in the First Five-Year Review Report (TtNUS, 2001).

#### Year 3

Four quarterly rounds of sampling (Rounds 9, 10, 11, and 12) were conducted during 2000/2001 (Year 3). Figure 4-2 shows groundwater data that exceeded criteria during Year 3 of the monitoring program. The results obtained for Year 3 indicated no exceedances of primary criteria. The following constituents exceeded secondary criteria: BEHP, benzo(a)pyrene, benzo(k)fluoranthene, arsenic, copper, lead, silver, and zinc.

A statistical evaluation of data from Year 3 indicated increases in 1,2-dichloroethene, vinyl chloride, arsenic, barium, chromium, lead, and silver concentrations when comparing data from upgradient and downgradient of the landfill. None of the detected concentrations of COPCs were in excess of primary monitoring criteria, indicating that no significant contaminant migration was occurring from the DRMO.

The average arsenic and barium concentrations for each round were plotted as a function of time to determine trends in the data. The plots did not show any significant trends in arsenic or barium detections that would indicate a contaminant migration problem from the DRMO site. The correlation between arsenic and barium detections and oxidation-reduction potential (ORP) was also tested as part of the analysis. The results of the evaluation indicated that concentrations of these metals in downgradient wells were only weakly to moderately correlated with ORP values.

## Year 4

Two rounds of sampling (Rounds 13 and 14) were conducted during 2001/2002 (Year 4). Figure 4-3 shows groundwater data that exceeded criteria during Year 4 of the monitoring program. The results obtained during Rounds 13 and 14 of groundwater monitoring for VOCs, SVOCs, pesticides/PCBs, and inorganics indicated no exceedances of primary criteria. None of the VOCs exceeded secondary criteria. BEHP was detected at concentrations that exceeded the secondary monitoring criterion in several

samples. No pesticides or PCBs were detected in any of the groundwater samples collected during Year 4. Concentrations of arsenic, copper, silver, and zinc detected in some groundwater samples were in excess of secondary screening criteria. Concentrations of arsenic and zinc detected in some samples also exceed background concentrations.

Statistical comparisons indicated that downgradient concentrations of some COPCs were statistically greater than concentrations detected in upgradient wells. However, none of the detected concentrations of COPCs were in excess of primary monitoring criteria, indicating that no significant contaminant migration is occurring from the DRMO. The evaluation also indicated that no temporal increases in BEHP, arsenic, and silver concentrations were evident over the two sampling rounds.

#### Year 5

One round of sampling (Round 15) was conducted during 2003 (Year 5). The Round 15 results showed that 11 of the 21 COPCs were detected in groundwater. Screening of the analytical data against the current primary and secondary criteria showed no exceedances of primary criteria, but concentrations of BEHP, copper, and zinc exceeded secondary criteria. Figure 4-4 shows groundwater data that exceeded criteria during Year 5 of the monitoring program.

The Year 5 monitoring results were generally similar to the results of the first 4 years of groundwater monitoring. The results do not indicate significant contaminant migration from Site 6.

#### Year 6

One round of sampling (Round 16) was conducted during 2004 (Year 6). The results obtained during Round 16 of groundwater monitoring showed no exceedances of primary criteria, but concentrations of BEHP, arsenic, copper, silver, and zinc exceeded secondary criteria, and arsenic and lead concentrations exceeded background levels. Figure 4-5 shows groundwater data that exceeded criteria during Year 6 of the monitoring program.

Statistical comparisons indicated that two COPCs (vinyl chloride and total copper) were detected in downgradient wells at concentrations that were statistically higher than concentrations in upgradient wells; however, the levels and history of these COPCs do not indicate that significant concentrations of COPCs are migrating from Site 6.

### Year 7

One round of sampling (Round 17) was conducted during 2005 (Year 7). The results obtained during Round 17 of groundwater monitoring showed no exceedances of primary criteria, but detected concentrations of BEHP and copper exceeded secondary criteria, and detected concentrations of zinc exceeded secondary criteria and the NSB-NLON background concentration. Figure 4-6 shows groundwater data that exceeded criteria during Year 7 of the monitoring program.

Although downgradient results for three COPCs (BEHP, pyrene, and copper) are statistically greater than upgradient concentrations, these results are consistent with historical results and do not indicate that significant contaminant migration is occurring from Site 6.

#### 4.5.2.2 O&M Data Review

Inspections are being conducted as part of post-closure O&M activities associated with Site 6. The goal of the inspections is to determine if appropriate O&M is being performed to maintain the effectiveness of the remedial action. As indicated in the table below, three inspections have been performed at Site 6 since the cap system was installed. All of the inspections were performed during the period being evaluated in this second five-year review. The findings of the annual inspections are summarized below.

Year	Date of Initial Inspection	Date of Supplemental Inspection	Final Report Date
2003	July 11, 2003	November 4, 2003	November 2004
2004	December 29,2004	April 26, 2005	September 2005
2005	October 11, 2005	NA	October 2005

NA – Not Applicable

## 2003

A copy of the completed 2003 Inspection Checklist for the DRMO is provided in Appendix A. The inspection showed that the cap system was in generally good condition and was functioning as designed and was meeting the long-term remedial objectives. However, the inspection identified the following deficiencies:

- Additional signage that identified the site as a capped landfill was recommended.
- Significant water ponding along the western side of the site due to sedimentation around jersey barriers was restricting surface water drainage.
- One sink hole was identified immediately south of the cap limit.

- Monitoring well 6MW2D, in the vicinity of the sinkhole, was leaning toward the river.
- Dense vegetation was observed in the northern portions of the swale, in riprap, and on the security fencing.
- Damaged road boxes and/or missing well caps at wells 6MW6D, 6MW10D, and 6MW11D.
- Several groundwater well road boxes were submerged beneath standing water.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. The following corrective actions were implemented to address the deficiencies: the sinkhole was repaired and vegetation was removed from security fencing, riprap, and the catch basin inlet. The corrective actions were implemented prior to November 2003.

#### 2004

A copy of the completed 2004 Inspection Checklist for the DRMO is provided in Appendix A. The inspection showed that the landfill was generally in good condition, was functioning as designed, and was meeting the long-term remedial objectives. However, the inspection identified the following deficiencies:

- A build-up of sediment along the jersey barriers at the northwestern portion of the site.
- Two depressions in the pavement were observed to the south of 6MW11D.
- Dense vegetation was observed around the catch basin inlet and in the riprap.
- The road box at monitoring well 6MW11D was damaged, and the surrounding concrete had cracked.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. The corrective actions were implemented in July 2005. Actions taken included vegetation and sediment removal and herbicide applications along the jersey barriers, riprap, and catch basin inlet; repair of the well 6MW11D road box, and filling of the depression adjacent to the well 6MW11D road box with cold patch. The depressions to the south of well 6MW11D will be monitored.

## 2005

A copy of the completed 2005 Inspection Checklist for the DRMO is provided in Appendix A. The inspection showed that the landfill was in generally good condition, was functioning as designed, and was meeting the long-term remedial objectives. However, the inspection identified the following deficiencies:

- Standing water was observed during the inspection along the western portion of the site, parallel to the jersey barriers.
- Depressions in the pavement were observed in the vicinity of jersey barriers along the western site perimeter.
- A piece of concrete was imbedded in the asphalt near 6MW10D.
- Eight inches of sediment were observed in the catch basin.
- Monitoring well 6MW7S was depressed into the asphalt, causing water to pond on top of the road box. Monitoring well 6MW8S was under a pallet, and sediment had built up over the well cover. The concrete surface of 6MW10D was cracked.
- Monitoring well 6MW4S could not be located. This well had not been sampled during previous events.
- Access was not granted to monitoring wells 6MW5S and 6MW5D due to security restrictions.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. It is expected that the corrective actions will be implemented during the summer of 2006.

## 4.5.3 ARAR and Site-Specific Action Level Changes

The final remedial action implemented for soil and groundwater at the DRMO includes monitoring of groundwater and institutional controls. No new human health ARARs have been promulgated that would call into question the protectiveness of the remedy for soil. ARARs and TBCs were reviewed to determine whether there have been changes since the Interim ROD and Groundwater Monitoring Plan were issued. Listings of chemical-specific, location-specific, and action-specific ARARs, advisories and guidance (TBCs) that were considered in the Final ROD are listed in Tables 6-1, 6-2, and 6-3, respectively. With the exception of monitoring criteria, the ARARs were addressed during monitoring well installation or selection of the remedy but they would also be applicable during future operation and maintenance activities for the remedy. Changes associated with monitoring are addressed in the response to Question 2 of Section 4.5.

The presence of the cap effectively eliminated direct contact with contaminated soil at the site, and the soil at the DRMO represents little potential risk to ecological receptors. Therefore, any changes in

screening values since the completion of the ERA would not impact the effectiveness of the remedial action. If the cap would be destroyed in the future due to artificial or natural forces, there could be a potential risk to ecological receptors.

### 4.5.4 Site Inspection

The DRMO was inspected on April 4, 2006. The focus of the inspection was on the engineered cap system installed over the DRMO. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. Photographs taken of site features during the inspection are provided in Appendix B. The site inspection checklist completed during the inspection is provided in Appendix C.

The site inspection included visual observations of the current condition of the cap system at Site 6. During the site inspection, the team found that the land use for the site has remained unchanged since the remedial action and the first five-year review were completed, although it was noted that the land use may change in the future (i.e., the site may become a parking lot for the NSB-NLON Yacht Club). The Navy has continued to use the area for equipment storage. A sign was posted at the gate to the site noting land use restrictions. Visitors to the site were required to sign in, and the inspection team was escorted by site personnel throughout the inspection. In general, the site inspection found that the cap system was working as intended. However, even though the Navy has implemented an O&M program for Site 6 and corrective actions have been taken, a number of items were identified during the site inspection that, if not addressed, could negatively affect the long-term performance of the cap system. These items are noted in the site inspection checklist provided in Appendix C and on Figure 4-1. The items and their potential long-term impacts on the cap system are as follows:

- Jersey barriers along the western portion of the site cause water to pond on the cap.
- The asphalt has a small amount of cracks and depressions. If the cracks are not sealed, surface
  water will penetrate the asphalt and further deteriorate the asphalt during freeze-thaw cycles. One
  depression was filled in and others are being monitored to determine whether the problem is
  progressive or stable.
- Monitoring well 6MW4S cannot be located; stored items adjacent to Building 491 were previously
  moved and the well could not be located. It is assumed that the well was abandoned during the
  removal action and cap installation, but no records were prepared to formally document the
  abandonment.

 Two monitoring wells (6MW5S and 6MW5D) were found to be inaccessible due to security restrictions. If it is determined that these wells are no longer needed in the monitoring program, they should be properly abandoned. Monitoring well 6MW7S is not currently used for the monitoring program and should be considered for abandonment.

## 4.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second 5-year review. Relevant discussions with the inspection team regarding the site are documented on the site inspection checklist.

#### 4.6 ASSESSMENT

The following conclusions support the determination that the remedy at Site 6 is protective of human health and the environment.

#### Question 1. Is the remedy functioning as intended by the decision documents?

- Remedial Action Performance: A TCRA was completed and a cap was installed at the DRMO. The cap is currently effective in limiting direct exposure to remaining contaminated soil and minimizing infiltration and contaminant migration from the site. A groundwater monitoring program has been implemented as part of the interim and final remedies for the site to evaluate the performance of the cap regarding minimizing contaminant migration to the Thames River. The results of 7 years of monitoring indicate that no significant contaminant migration is occurring from the DRMO. An eighth year of monitoring is currently being conducted. Should groundwater data indicate the need to evaluate additional remedial actions at some point in the future, the Navy will perform the evaluation at that time. Proper O&M is necessary to maintain proper long-term performance of the cap.
- System Operations/O&M: An O&M Manual was developed and implemented in 2003. The cap system is still functioning as intended, and O&M of the cap system is being performed annually at the site. The items noted in Section 4.5.4 should be addressed to improve the O&M of the site.

Actual costs for the monitoring program have ranged from approximately \$123,000 per year to \$44,200 per year (see table below). Costs have generally decreased due to optimization of the monitoring program. The costs include the costs associated with sampling, analysis, validation, and reporting. Costs associated with preparing and updating the Monitoring Plan and maintaining the groundwater monitoring wells are not included in the costs.

Source	Cost of Monitoring
Projected Annual Cost in ROD	\$84,000 for the
	first 3 years
Actual Year 1 Cost (1998/1999)	\$120,000
Actual Year 2 Cost (1999/2000)	\$120,000
Actual Year 3 Cost (2000/2001)	\$123,000
Actual Year 4 Cost (2001/2002)	\$62,700
Actual Year 5 Cost (2003)	\$44,200
Actual Year 6 Cost (2004)	\$45,600
Actual Year 7 Cost (2005)	\$48,100

The cost for annual O&M estimated during preparation of the ROD was \$10,200. O&M of the cap system began in 2003, and costs have ranged from approximately \$10,700 to \$10,900 per year (see table below). Costs have fluctuated due to the amount of maintenance required and the amount of funding available. The annual O&M costs include the costs for landfill inspections, reporting, and maintenance.

Source	Cost of O&M
Projected Annual Cost in ROD	\$10,200
Actual Year 1 Cost (2003)	\$10,700
Actual Year 2 Cost (2004)	\$10,900
Actual Year 3 Cost (2005)	\$10,800

- Opportunities for Optimization: The sampling frequency of the monitoring program was reduced from quarterly to annually. The monitoring frequency should be further reduced to biennial (every 2 years). During Year 4, three monitoring wells were eliminated from the monitoring program, 2,3,3',4,5,6-hexachlorobiphenyl was eliminated as a COPC, and a corrected SWPC for phenanthrene was used to evaluate the monitoring data. During Year 7, monitoring of pesticides and PCBs was discontinued.
- Early Indicators of Potential Remedy Failure: There were deficiencies noted during the O&M inspections of the cap system. Currently, the deficiencies do not compromise the protectiveness of the remedy, but if they are left unaddressed, they could result in remedy failure in the future.
- Implementation of Institutional Controls and Other Measures: Institutional controls associated with Site 6 are being implemented in accordance with New London Instruction 5090.18C. The area is secured with fencing and signs are posted warning personnel not to dig in the area.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: In the first Groundwater Monitoring Plan for the DRMO (B&RE, 1998), a combination of site-specific SWPC, Connecticut SWPC, and Connecticut Volatilization Criteria were identified as the primary monitoring criteria and a combination of the federal AWQC and the Connecticut WQSs were identified as the secondary monitoring criteria. The monitoring plan and criteria for the DRMO were recently updated during finalization of the O&M Manual (TtNUS, 2006a). The following changes were noted between the plans:
  - The federal AWQC were updated in 2006 and the Connecticut WQSs were updated in December 2002.
  - Site-specific SWPC were updated based on the changes to the Connecticut WQSs and Thames River dilution factors.
  - The SWPC for phenanthrene (0.077  $\mu$ g/L) in the 1996 CTDEP RSRs was found to be incorrect and was updated to 0.3  $\mu$ g/L. This correction was confirmed with the CTDEP. None of the other CTDEP SWPC for the COCs have changed.

A comparison of the old and new primary criteria is presented in Table 2-4. A similar comparison of old and new secondary criteria is presented in Table 2-5. The changes in criteria do not impact the protectiveness of the remedy.

- Changes in Exposure Pathways: Because a cap was installed at the DRMO, the direct exposure
  pathway for human and ecological receptors to come into contact with contaminated soil related to
  the DRMO was eliminated. This change was planned as part of the TCRA. The land use of the
  DRMO may change in the future to a parking lot for a Yacht Club. The change in site conditions
  should not effect exposure pathways (i.e., there are no new contaminants, sources, or direct routes of
  exposure).
- Changes in Toxicity and Other Contaminant Characteristics: Toxicity and other factors for COCs have not changed.
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodologies since the signing of the Interim ROD. In addition, as presented in

Section 1.4, no significant changes have occurred in the ERA methodology since the ERA was conducted.

• Expected Progress Towards Meeting RAOs: The RAOs for OU2 were met by performing the removal action, installing and maintaining the cap system, and conducting groundwater monitoring.

### Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

#### 4.7 ISSUES

A few O&M deficiencies were noted during the five-year review site inspection that should be resolved. The deficiencies are presented in Sections 4.5.4 and summarized in Table 4-6.

#### 4.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and review, the following recommendations are made for Site 6.

- Continue O&M of the site and address the O&M deficiencies noted in Sections 4.5.4 and 4.7.
- Continue the monitoring program, but reduce sampling frequency to every 2 years and further
  optimize the analytical parameter list, as appropriate. Develop and implement a well abandonment
  program to eliminate wells that are no longer required for the monitoring program (e.g., 6MW5S,
  6MW5D, and 6MW7S)
- Develop and implement an equipment storage plan that would prevent storage of equipment on top of active monitoring well(s).
- Address ponding and sediment buildup due to the jersey barriers.
- Continue enforcement of New London Instruction 5090.18C. If the site use changes to yacht club
  parking, enforcement of New London Instruction 5090.18C should be continued.

- At least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews.
- Amend O&M Manual to remove federal AWQC.

Follow-up actions should be completed by the Navy in a timely manner to address the recommendations.

#### 4.9 PROTECTIVENESS STATEMENT

The remedy at the DRMO is currently protective of human health and the environment. A majority of the original source was removed during a TCRA, and the remaining source material is contained. The cap system minimizes infiltration and subsequent contaminant migration and prevents direct contact with soil. A groundwater monitoring program is being implemented at the site, and the results of the program indicate that the removal action and cap are performing as planned. Continued implementation of land use controls and O&M will maintain the effectiveness of the remedy into the future.

## CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirements	Current Status / Applicability				
FEDERAL	FEDERAL							
Cancer Slope Factors (CSFs)	None	To Be Considered	CSFs are guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants	The selected remedy prevents exposure to contaminated media and thereby minimize human health concerns. This TBC would be used to recalculate risks if the site was altered in the future in a way that would change exposure scenarios.				
Guidelines for Carcinogen Risk Assessment	EPA/630/P-03/001F (March 2005)	To Be Considered	This is a general guidance document that provides a framework for assessing possible cancer risks from exposures to pollutants or other agents in the environment. The document discusses issues involving hazard identification, dose-response assessment, exposure assessment, and risk characterization with an emphasis on characterization of evidence and conclusions in each area of the assessment. As part of the characterization process, explicit evaluations are made of the hazard and risk potential for susceptible lifestages, including children.	The selected remedy prevents exposure to contaminated media and thereby minimize human health concerns. This TBC would be used to recalculate risks if the site was altered in the future in a way that would change exposure scenarios.				
Reference Doses (RfDs)	None	To Be Considered	RfDs are guidance values used to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	The selected remedy prevents exposure to contaminated media and thereby minimize human health concerns. This TBC would be used to recalculate risks if the site was altered in the future in a way that would change exposure scenarios.				
Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens	EPA/630/R-03/003F (March 2005)	To Be Considered	The Supplemental Guidance addresses a number of issues pertaining to cancer risks associated with early-life exposures generally, but provides specific guidance on potency adjustment for carcinogens acting through a mutagenic mode of action. This guidance recommends a default approach using estimates from chronic studies (i.e., CSFs) with appropriate modifications to address the potential for differential risk of early-lifestage exposure.	The selected remedy prevents exposure to contaminated media and thereby minimize human health concerns. This TBC would be used to recalculate risks if the site was altered in the future in a way that would change exposure scenarios.				

STATE OF CONNECTICUT

There are no chemical-specific ARARs.

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPORPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
FEDERAL				
Executive Order 11988 RE: Floodplain Management	Executive Order 11988	Applicable	This order requires federal agencies, wherever possible, to avoid or minimize adverse impacts upon floodplains. Requires reduction of risk of flood loss, minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values of the floodplains.	This regulation was addressed during monitoring well installation within the 100-year floodplain. This requirement is applicable during well abandonment and O&M of the remedy.
Coastal Zone Management Act	16 USC Parts 1451 et seq.	Applicable	Requires that any actions must be conducted in a manner consistent with state approved management programs.	This site is located in a State coastal flood zone (within the 100-year floodplain). Therefore, applicable State coastal zone management requirements were considered during determination of the Selected Remedy. This regulation would be applicable if the site use was changed or the site was altered.
Fish and Wildlife Coordination Act	16 USC 661 et seq.; 40 CFR § 6.302	Applicable	Requires action to be taken to protect fish and wildlife from projects affecting streams or rivers.  Consultation with U.S. Fish & Wildlife Service to develop measures to prevent and mitigate loss.	This regulation was addressed during monitoring well installation within the river's tidal zone. This requirement is applicable during well abandonment and O&M of the remedy.
STATE OF CONNECTICUT				
Coastal Management Act	CGS §§ 22a-92 and 94	Applicable	Requires projects within a State-designated coastal zone to minimize adverse impacts on natural coastal resources.	This regulation was addressed during monitoring well installation within the 100-year floodplain. This requirement is applicable during well abandonment and O&M of the remedy.
Tidal Wetlands	RCSA §§ 22a-30-1 through 17	Applicable	Activities within or affecting tidal wetlands are regulated.	This regulation was addressed during monitoring well installation within the river's tidal zone. This requirement is applicable during well abandonment and O&M of the remedy.

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPORPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
STATE OF CONNECTICUT (C	ontinued)			
Connecticut Endangered Species Act	CGS §§ 26-303 through 314	Applicable	Regulates activities affecting State-listed endangered or threatened species or their critical habitat.	The State-threatened Atlantic sturgeon inhabits the Thames River. Because monitoring wells were installed in the river's tidal zone, protection of the Atlantic Sturgeon's habiltat was considered during installation. This requirement is applicable during well abandonment and O&M of the remedy.

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
FEDERAL				
Guidance on Remedial Actions for Superfund Sites with PCB Contamination	OSWER Directive 9355.4-01	To Be Considered	This guidance describes how to address PCB contamination issues.	Low levels of PCBs (47.2 ppm or less) remain in the soil at the site. The land use (industrial) was selected in accordance with these regulations. This guidance will be followed when conducting O&M or if the site use changes, such as if the site is used for Yacht Club parking.
STATE OF CONNECTICUT				
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a-449 (c) 100-101	Applicable	These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference.	This regulation was addressed during monitoring well installation. This requirement is applicable during well abandonment and O&M of the remedy.
Hazardous Waste Management: TSDF Standards	RCSA § 22a-449 (c) 104	Applicable	This section establishes standards for groundwater monitoring and post-closure. The standards of 40 CFR 264 are incorporated by reference.	The remedy complies with the post-closure requirements of this section through groundwater monitoring and institutional controls at the Site.
Control of Noise Regulations	RCSA § 22a-69-1 through 7.4	Applicable	These regulations establish allowable noise levels. Noise levels from construction activities are exempt from these requirements.	This regulation was addressed during monitoring well installation. This requirement is applicable during well abandonment and O&M of the remedy.
Guidelines for Soil Erosion and Sediment Control	The Connecticut Council on Soil and Water Conservation	To Be Considered	The guidelines provide technical and administrative guidance for the development, adoption, and implementation of a erosion and sediment control program.	This regulation was addressed during monitoring well installation. This requirement is applicable during well abandonment and O&M of the remedy.
Water Quality Standards	CGS 22a-426	Applicable	Connecticut's WQSs establish specific numeric criteria, designated uses, and anti-degradation policies for groundwater and surface water.	The Connecticut WQSs were used to calculate the Alternative SWPC and are being used as secondary monitoring criteria to evaluate monitoring results and determine if further remedial action is required to protect resources. Updates to the Connecticut WQSs are discussed in Section 2.7.2. Changes to the WQSs in the future will need to be considered.

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Synopsis of Requirement	Current Status / Applicability
STATE OF CONNECTICUT	(Continued)			
Remediation Standards Regulations	RCSA § 22a-133k-3	Applicable	These regulations provide specific numeric cleanup criteria for a wide variety of contaminants in soil, groundwater, and soil vapor. These criteria include volatilization criteria, pollutant mobility criteria, direct exposure criteria, and SWPCs.	Although no groundwater plume has been identified at this site, groundwater monitoring will continue to be conducted to confirm no COCs are migrating off site at levels above Alternative Surface Water Protection Criteria or CTDEP Volatilization Criteria.  Maintenance of the cap and continued implementation of institutional controls will satisfy the CTDEP RSRs for soil. The Alternative SWPC for COCs at the DRMO were calculated following the CTDEP RSRs and are protective of receptors in the Thames River.

TABLE 4-4

### COMPARISON OF PRIMARY MONITORING CRITERIA SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON NSB-NLON, GROTON, CONNECTICUT

	Background	Primary Monitoring Criteria					
Chemical		Site-Specific SWPC <sup>(2,3)</sup>		CTDEP SWPC(4)		CTDEP Volatilization (5)	
	Concentration <sup>(1)</sup>	1998 <sup>(2)</sup>	2006 <sup>(3)</sup>	1998 <sup>(2)</sup>	2006 <sup>(3)</sup>	1998 <sup>(2)</sup>	2006 <sup>(3)</sup>
VOCs (μg/L)							
1,1,2,2-Tetrachloroethane	NA	1,100	6,050	110	110	100	64
1,2-Dichloroethane	NA	29,700	54,500	2,970	2,970	90	68
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	24,000
Trichloroethene	NA	23,400	42,700	2,340	2,340	540	67
Vinyl chloride	NA	157,500	289,000	15,750	15,750	2	52
SVOCs and PAHs (µg/L)		•	•				
Benzo(a)anthracene	NA	3	270	0.3	0.3	NA	NA
Benzo(a)pyrene	NA	3	27	0.3	0.3	NA	NA
Benzo(b)fluoranthene	NA	3	270	0.3	0.3	NA	NA
Benzo(k)fluoranthene	NA	3	270	0.3	0.3	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	590	3,250	59	59	NA	NA
Fluoranthene	NA	37000	704	3,700	3,700	NA	NA
Fluorene	NA	1,400,000	27,100	140,000	140,000	NA	NA
Naphthalene	NA	NA	11,300,000	NA	NA	NA	NA
Phenanthrene	NA	1	27,000	0.077	0.3	NA	NA
Pyrene	NA	1,100,000	27,000	110,000	110,000	NA	NA
Inorganics (µg/L)							
Arsenic	1.92/2.55	40	11.6	4	4	NA	NA
Barium	227/124	NA	NA	NA	NA	NA	NA
Cadmium	NA	60	5,120	6	6	NA	NA
Chromium (hexavalent)	49.9/16.0	1,100	25,500	110	110	NA	NA
Copper	107/39.4	480	1,710	48	48	NA	NA
Lead	6.63/2.52	130	4,460	13	13	NA	NA
Silver	NA	120	59,200,000	12	12	NA	NA
Zinc	131/109	1,230	44,600	123	123	NA	NA

#### Notes:

- 1 Total/dissolved inorganic background concentrations from the BGOURI (TtNUS, 2002).
- 2 Groundwater Monitoring Plan for Defense Reutilization and Marketing Office (B&RE, 1998).
- 3 Volume II of the O&M Manual for IRP Sites at NSB-NLON (TtNUS, 2006).
- 4 SWPC for substances in groundwater (CTDEP, 1996).
- 5 Industrial/commercial volatilization criteria for groundwater (CTDEP, 1996 and 2003).

Shading indicates that the criteria has changed.

TABLE 4-5

#### COMPARISON OF SECONDARY CRITERIA SITE 6 - DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

	CTDEP WQSs <sup>(1)</sup>						
Chemical	Aqua	tic Life <sup>(2)</sup>	Humai	n Health <sup>(3)</sup>			
	May 1992	December 2002	May 1992	December 2002			
VOCs (μg/L)			-	•			
1,1,2,2-Tetrachloroethane	NA	NA	11	11			
1,2-Dichloroethane	NA	NA	99	99			
cis-1,2-Dichloroethene	NA	NA	NA	NA			
trans-1,2-Dichloroethene	NA	NA	NA	NA			
Trichloroethene	NA	NA	81	81			
Vinyl Chloride	NA	NA	525	525			
SVOCs (μg/L)	*	<del>'</del>		*			
Benzo(a)anthracene	NA	NA	0.031	0.49			
Benzo(a)pyrene	NA	NA	0.031	0.049			
Benzo(b)fluoranthene	NA	NA	0.031	0.49			
Benzo(k)fluoranthene	NA	NA	0.031	0.49			
Benzoic Acid	NA	NA	NA	NA			
Bis(2-ethylhexyl)phthalate	NA	NA	5.9	5.9			
Fluoranthene	NA	NA	370	1.28			
Fluorene	NA	NA	14,000	49.2			
Naphthalene	NA	NA	NA	20513			
Phenanthrene	NA	NA	0.031	49.17			
Pyrene	NA	NA	11,000	49			
Pesticides/PCBs (μg/L)	•		· ·	•			
4,4'-DDD	NA	NA	0.00084	0.00084			
Aroclor-1254	0.03	0.03	0.000045	0.00017			
Aroclor-1260	0.03	0.03	0.000045	0.00017			
Heptachlor Epoxide	0.0008	0.0036	0.00011	0.00011			
Inorganics (total/dissolved) (μg/L	)	-		•			
Arsenic	36	36	0.14	0.021			
Barium	NA	NA	NA	NA			
Cadmium	9.3	9.3	170	10769			
Chromium	50	50	3400	2019			
Copper	2.9	3.1	NA	NA			
Lead	8.5	8.1	NA	NA			
Silver	2.3 <sup>(4)</sup>	1.96 <sup>(4)</sup>	65000	107692			
Zinc	86	81	NA	68740			

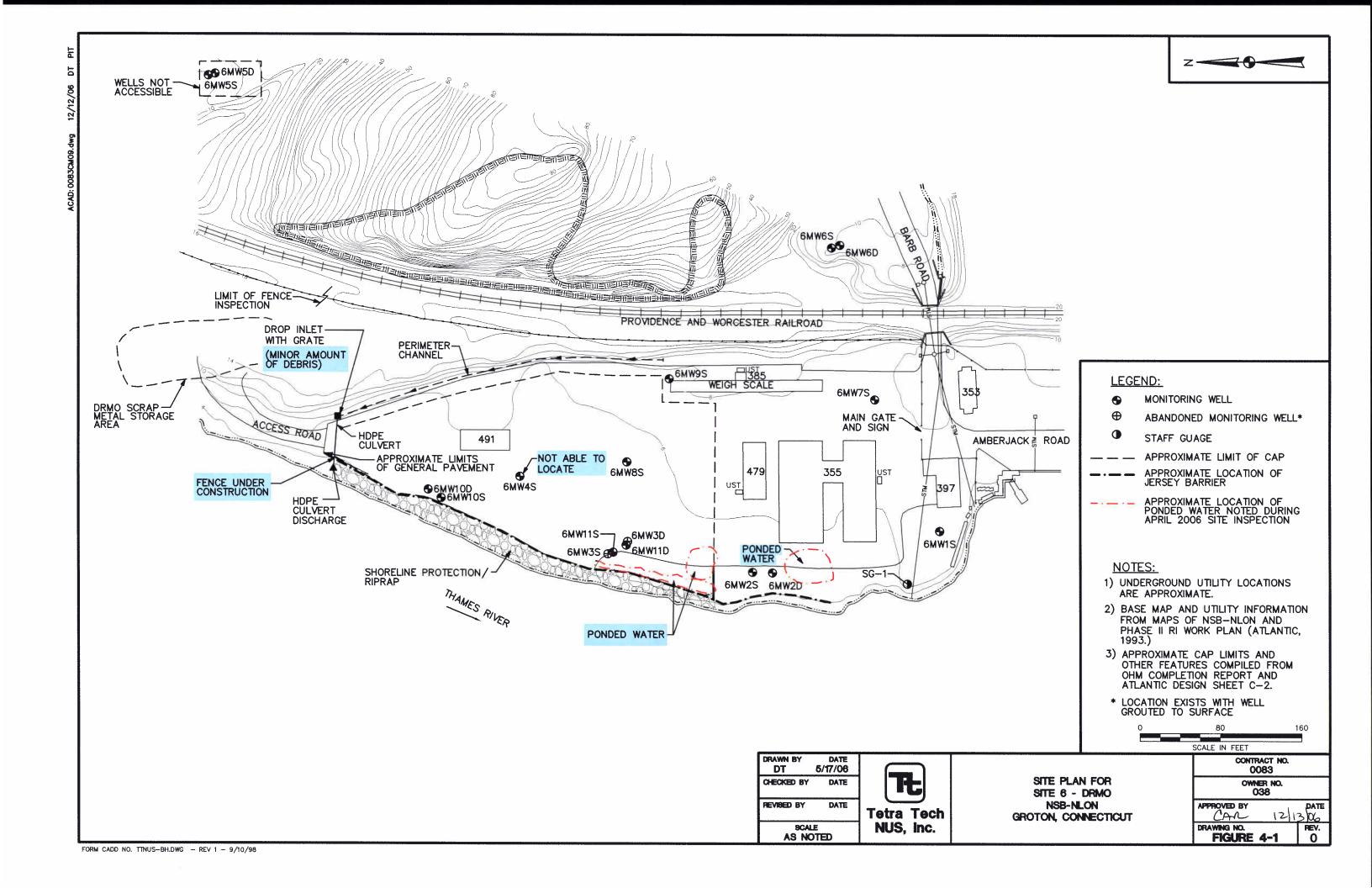
#### NA - Not available.

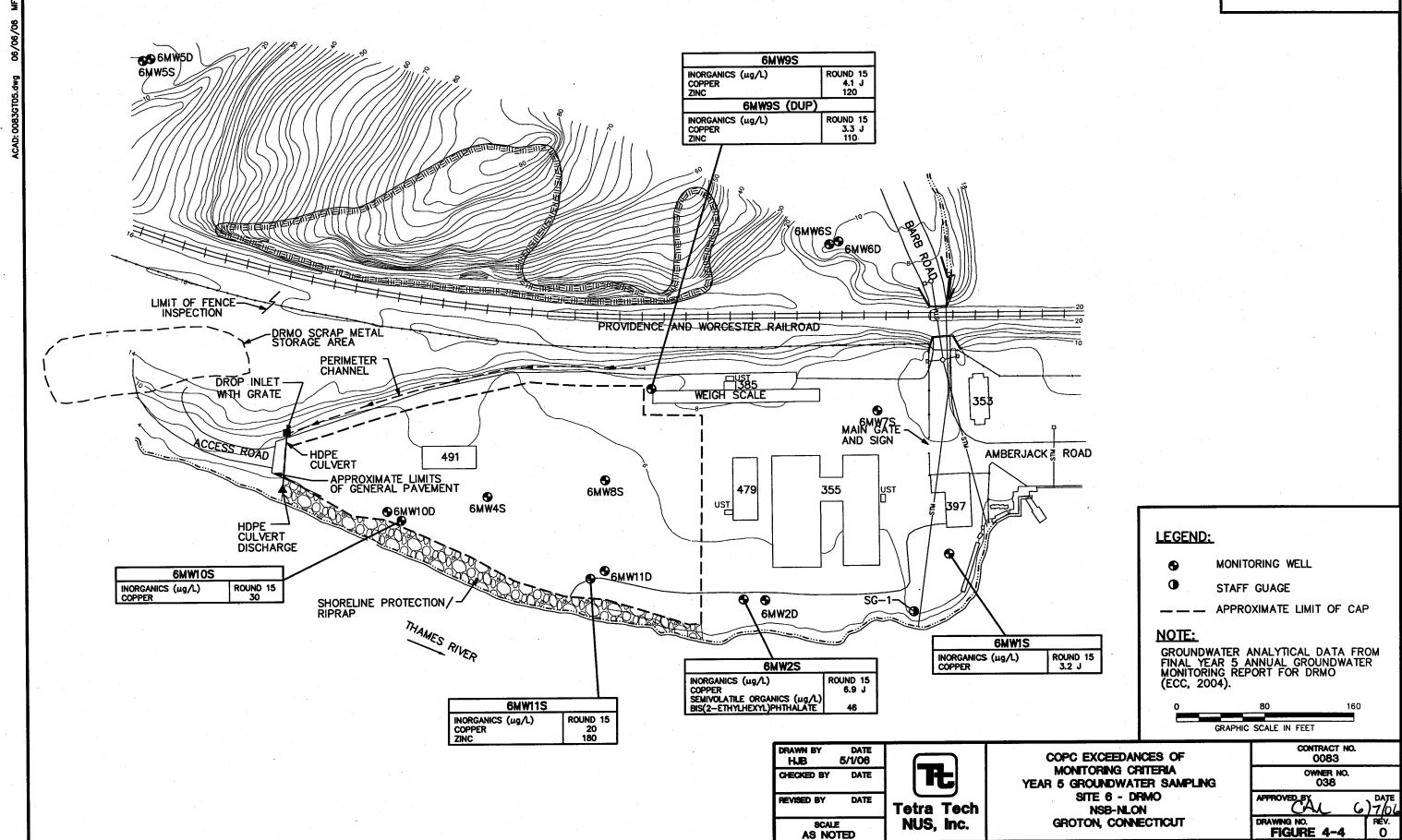
- 1 Water Quality Standards.
- 2 Criterion for saltwater at a chronic concentration.
- 3 Criterion for consumption of organisms only.
- 4 Criterion for saltwater at an acute concentration.

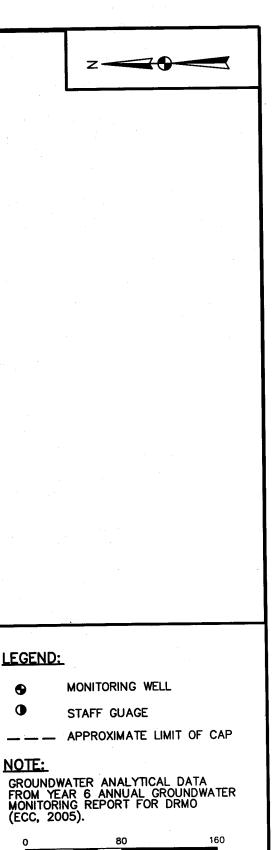
Shading indicates that the criterion has changed.

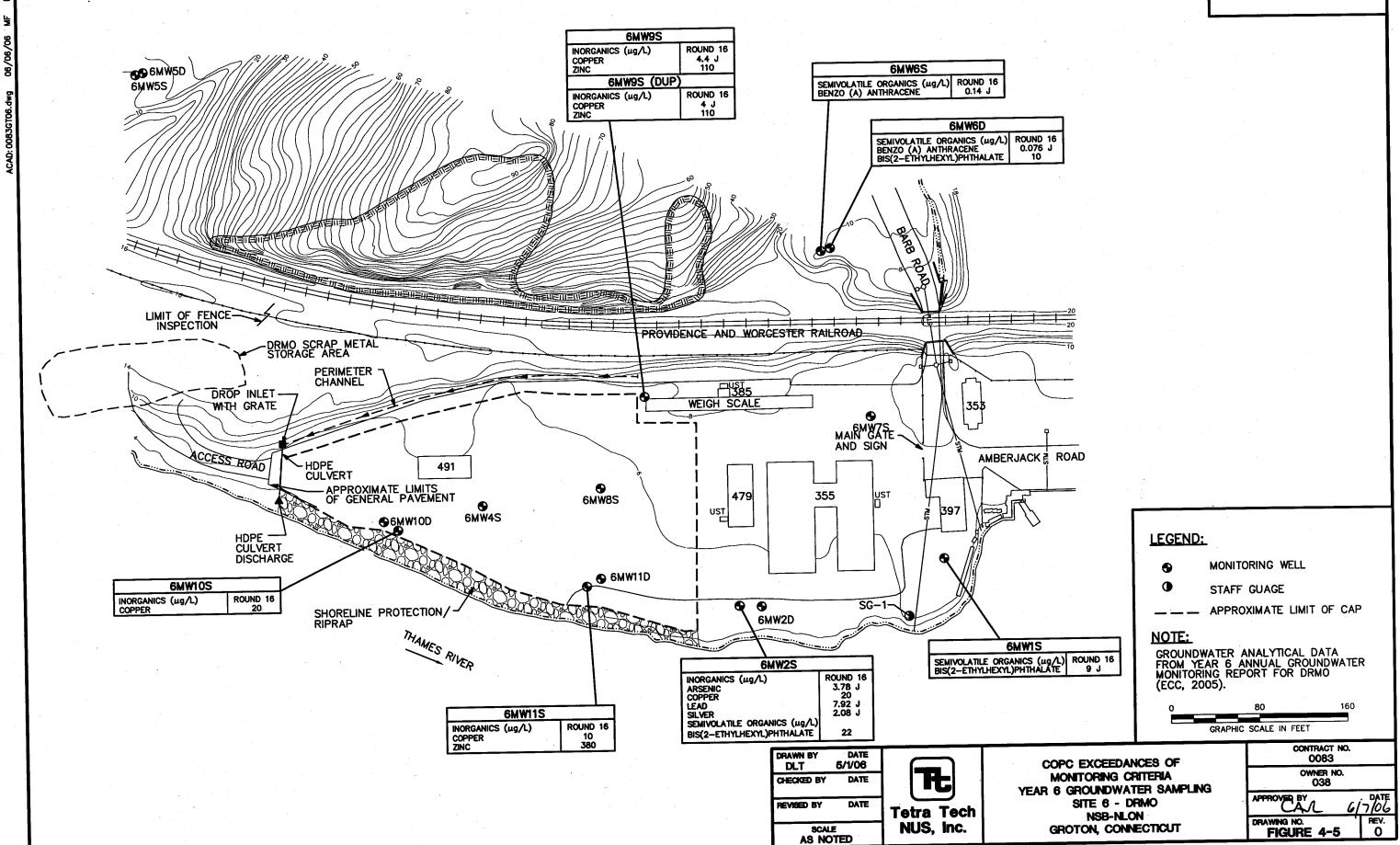
## SITE 6 DEFICIENCIES SITE 6 – DEFENSE REUTILIZATION AND MARKETING OFFICE NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

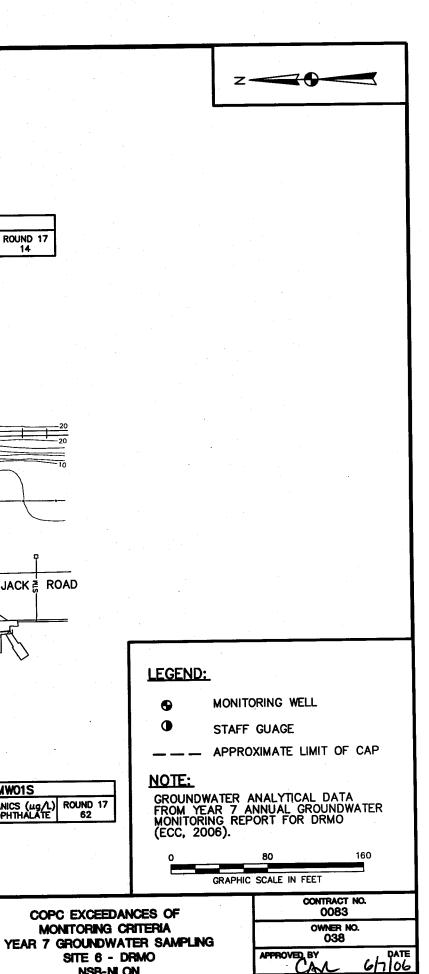
Deficiency	Effects Protectiveness		
	Current	Future	
Ponding of water along jersey barriers	N	Y	
Cracks and depressions in asphalt	N	Y	
Maintenance of monitoring wells and dedicated sampling equipment	N	Y	
Abandonment of unused monitoring wells	N	Υ	



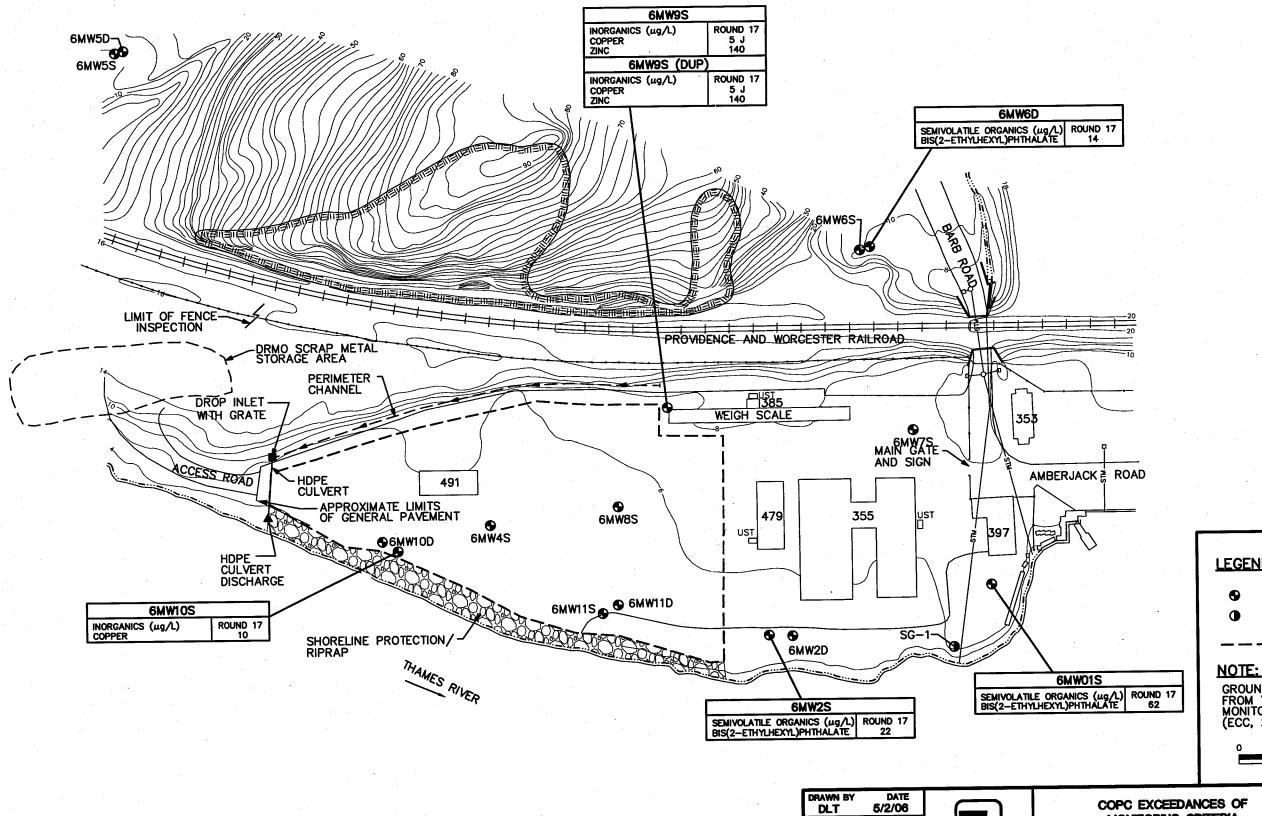








DRAWING NO. FIGURE 4-6



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SCALE AS NOTED

DATE

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NUS, Inc.

NSB-NLON

GROTON, CONNECTICUT

#### 5.0 SITE 7 - TORPEDO SHOPS (OU8 AND OU9)

Site 7 under the Navy's IRP includes the Torpedo Shops. This five-year review of Site 7 is required by statute because hazardous substances, pollutants, or contaminants remain in the groundwater at concentrations that do not allow for unlimited use or unrestricted exposure. Since the First 5-Year Review Report, the Proposed Plan (Navy, 2004) and ROD (Navy, 2004) for Site 7 soil and the Proposed Plan (Navy, 2004) and Interim ROD (Navy, 2004) for Site 7 groundwater have been completed. The selected remedial action for the soil OU (OU8) was excavation and off-site disposal. The remedial action for the soil was completed in May 2006, and the Remedial Action Report is under preparation. The selected remedy for the Site 7 groundwater OU, which is a portion of OU9, was institutional controls with monitoring. The selected remedy for the groundwater at this site is an interim remedy, but it is expected that it will be the final remedy after remedial actions are selected for all portions of OU9.

#### 5.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 7 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Building 325 – torpedo overhaul facility built.	1955
Building 450 – torpedo overhaul/assembly facility built.	1974
Building 325 leach field abandoned.	1975
New leach field used until sanitary sewers installed.	1983
Hazardous waste sump decommissioned.	1987
Visual inspection of Building 325 observed solvents.	1989
Phase I RI completed.	August 1992
Underground No. 2 fuel oil tank closed (one of two) and above-ground tank removed under RCRA.	1995
Investigation of two fuel oil tanks and removal action of TPH-contaminated soil completed under RCRA.	1996
Phase II RI completed.	March 1997
First Five-Year Review completed.	December 2001
BGOURI completed.	January 2002
BGOURI Update/FS completed.	July 2004
Proposed Plan for Site 7 Torpedo Shops and Site 14 OBDANE Soil (OU8) completed.	July 2004
ROD for Site 7 - Torpedo Shops and Site 14 – OBDANE Soil (OU8) signed.	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) completed.	September 2004

Event	Date
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater signed.	December 2004
LUC RD for Sites 3 and 7 Groundwater completed.	June 2005
Final O&M Manual - Volumes I, II, III, IV and V	January 2006
Remedial Action Work Plan/Design for Site 7 soil (OU8) completed.	February 2006
Work Plan for Remedial Action at Sites 3 and 7 (Groundwater) completed.	March 2006
Remedial Action for Site 7 soil completed.	May 2006
Round 1 of groundwater monitoring at Sites 3 and 7 completed.	May 2006
SOPA (ADMIN) New London Instruction 5090.18C issued.	December 2006

#### 5.2 BACKGROUND

The Torpedo Shops (Site 7) are located in the northern portion of NSB-NLON on the northern side of Triton Road. Figure 5-1 shows the general site arrangement. The site location with respect to other IR sites at NSB-NLON is shown on Figure 1-2. The site covers approximately 7 acres and is bordered on the east and north by 60-foot-high bedrock cliffs. The remainder of the site slopes to the southwest toward the Area A Downstream Watercourses (Site 3). An earthen berm extends along the base of the eastern portion of the exposed rock face. Three buildings (325, 450, and 477) exist at the site.

Building 325 is a torpedo overhaul facility. It was built in 1955 and had an on-site sanitary septic system until 1983, when all the building's plumbing facilities were connected to sanitary sewers. The original septic leach field for Building 325 was located southwest of the building, adjacent to Triton Road. This leach field became clogged in 1975 and was abandoned. A new leach field (south leach field) was constructed next to the original leach field and was used until sanitary sewers were installed in 1983.

A visual inspection of Building 325 was performed on March 20, 1989. According to interviews with on-site personnel, a variety of fuels, solvents, and petroleum products have been used in the building. Otto Fuel II [which is comprised of propylene glycol dinitrate (76 percent), 2-nitrodiphenylamine (1.5 percent), and di-n-butyl sebacate (22.5 percent) and produces hydrogen cyanide when burned], high-octane alcohol (190-proof grain alcohol), and TH-Dimer (jet rocket fuel) were observed in maintenance areas. Solvents including mineral spirits, alcohol, and 1,1,1-trichloroethane, as well as petroleum products such as motor oil and grease, were used in this building. A sink in one area was previously used for film development, and another sink was used for the overhaul of alkaline batteries. These sinks drained into the on-site septic system until 1983. A maintenance area has a shallow sump covered with a flush-mounted steel grating. The area surrounding this sump was previously a washdown/blowdown area for weapons. This sump drains to the storm sewer system on the western side of Building 325. Two underground No. 2 fuel oil tanks were located on the southern side of this building. One of the tanks was

closed in 1995. A third tank, which was located above ground adjacent to the building, was used for temporary storage of No. 2 fuel oil but, based on field reconnaissance, had been removed as of March 15, 1995.

A smaller building attached to the eastern side of Building 325 was also inspected. It was previously used as an assembly shop for torpedoes and was a paint shop at the time of the inspection. A storage closet in this building included containers of 1,1,1-trichloroethane and methyl ethyl ketone (2-butanone). Drums and cylinders stored outside on the eastern side of this building were labeled as containing propane, isobutane, 2-butanone, xylot, methylene chloride, propellant, and zinc chromate. An addition to the northern side of Building 325 was under construction at the time of the Atlantic inspection and has since been completed. This addition is also used as a torpedo shop.

Building 450 is the primary MK-48 torpedo overhaul/assembly facility. It was built in 1974 and was served by its own septic system until 1983, when it was connected to sanitary sewers. Only domestic wastewater from toilets, lavatories, and showers in Building 450 had been directed to the septic field (north leach field). Torpedo overhaul/assembly operations at Building 450 generate fuels, solvents, and petroleum products as wastes. An Otto Fuel and seawater mixture is drained from the torpedoes, which are then replenished with fresh fuel. The IAS report indicated that Building 450 generates approximately 3,000 gallons of Otto Fuel wastewater per month. This building was constructed with a waste collection system that collected waste products from floor drains and discharged to an underground waste tank/sump with a capacity of approximately 1,500 gallons. The waste tank was pumped periodically, and the contents were disposed off site. Otto Fuel product was previously stored in a 4,000-gallon underground tank south of Building 450.

Building 477, approximately 65 feet east of Building 450, was formerly used to store Otto fuel in drums. On-site personnel report that solvents including 1,1,1-trichloroethane, TCE, toluene, mineral spirits, alcohol, and bulk freon have been used at this facility. Petroleum products including TL-250 motor oil and hydraulic fluid have also been used in this building for torpedo maintenance. In the past, only domestic wastewater from toilets, lavatories, and showers in Building 450 was directed to the septic field (north system).

Atlantic performed a Site Inspection of Building 450 on March 20, 1989. The former septic leach field is located southwest of this building in a flat, elevated area. The hazardous waste sump was no longer in use and reportedly, was decommissioned in 1987. It was replaced with three 1,000-gallon above-ground tanks located south of the building. The floor drains were sealed and replaced with a new system for pumping waste products to the new tanks. A 4,000-gallon above-ground Otto Fuel storage tank replaced

the previous tank and is located south of the building. No construction is planned for the immediate future at Building 450.

The Phase I RI for Site 7 focused primarily on subsurface soils because the source being investigated at that time was the subsurface leach fields. The investigation began with a soil gas survey of the area surrounding Buildings 450 and 325. These results were used to guide the installation of monitoring wells and the collection of soil samples from the well and test borings. The Phase I RI concluded that there were negligible health risks associated with the Torpedo Shops and that this site should proceed to Step II of the IRP.

During the Phase II RI, sampling results included notable detections of contamination in soil and groundwater near the abandoned leach field. Minimal contamination was detected in surface water and sediment. The contamination detected in soil and groundwater at the site warranted further characterization; however, relatively low human health and ecological risks were present at the site. The HHRA showed that non-cancer risks were below acceptable levels except for the construction worker and future resident, and cancer risks were below acceptable levels except for a hypothetical future resident. Minimal exceedances of State criteria were observed for sediment, and no chemicals detected in surface water exceeded the State human health AWQC for the consumption of organisms and/or water and organisms. The Phase II RI recommended that further characterization of the Torpedo Shops be completed before determining whether or not the site should proceed to the FS stage.

A removal action was completed within Site 7 along the southern side of Building 325 in December 1995. This action was completed under the CTDEP UST Program. The focus of the effort was to remove soil contaminated with TPH in excess of the direct exposure remediation standard for residential use. Approximately 12 cubic yards of soil were removed from the site and disposed at an approved landfill (B&RE, 1996a).

The BGOURI (TtNUS, 2002a) was completed based on the recommendation of the Phase II RI. The objectives of the BGOURI at Site 7 were to further characterize the nature and extent of soil and groundwater contamination in the vicinity of the abandoned septic system and to quantify the risks to human receptors from the soil and groundwater. Organic contaminant detections in soils were scattered and were primarily PAHs. Metals detections were scattered and were in general only slightly greater than background concentrations. Groundwater sampling results from the BGOURI indicated only sporadic, low concentrations of contaminants in groundwater. A small plume of chlorobenzenes was detected west of Building 325, but there were no other discernable contaminant plumes of any size, indicating that there are no significant sources leaching contamination to groundwater at Site 7. Concentrations of BEHP and/or TCE in several wells located within the western portion of Site 7 exceeded MCLs. The HHRA

showed that the risks posed from exposure to contaminated soil at Site 7 were generally low; however, the risks posed by two chemicals exceeded CTDEP's target level for individual chemicals, and there were several chemicals detected at concentrations greater than CTDEP's direct exposure criteria. The risk assessment also determined that risks to current receptors from exposure to groundwater at Site 7 are within acceptable levels, but future residential groundwater usage could result in unacceptable risks.

An FS (TtNUS, 2004) was completed to identify and evaluate appropriate remedial alternatives for soil and groundwater at Site 7. Separate Proposed Plans and RODs were prepared to document the selected remedies for soil and groundwater. The remedy selected for soil was excavation and off-site disposal. A Remedial Action Work Plan was prepared for Site 7 soil in 2006 and the remedial action for the soil was completed in May 2006. The general tasks completed during the remedial action included the following:

- · Excavating soil and stockpiling on site.
- Performing confirmation sampling of the excavations.
- Dewatering excavations as necessary.
- Sampling stockpiled soil for waste characterization purposes.
- Backfilling excavated areas.
- Transporting and disposing of excavated soil.

The remedy selected for groundwater was institutional controls with monitoring. A Remedial Design for Land Use Controls was subsequently completed for Site 7 groundwater in June 2005. The Navy began implementation of the groundwater monitoring program as described in the Remedial Action Work Plan (TtNUS, 2006b) and Site 7 GMP (TtNUS, 2006a) in May 2006.

#### 5.3 REMEDIAL ACTIONS

#### 5.3.1 Remedy Selection

An FS was prepared to address Site 7 soil contaminated with PAHs, soil potentially contaminated with chlorobenzene (CB), dichlorobenzene (DCB), and benzene, and groundwater known to be contaminated with CB, DCB, and benzene. Chemicals such as TCE and hexachlorobenzene (HCB) found in Site 7 groundwater are of regional concern and were addressed with Site 3 groundwater.

The excavation and off-site disposal alternative for Site 7 soil was presented in the Proposed Plan in July 2004 (Navy, 2004b) and was formally selected in the ROD was signed in September 2004 (Navy, 2004f). The institutional controls and monitoring alternative for Site 7 groundwater was presented in the Proposed

Plan in September 2004 (Navy, 2004d) and was formally selected in the Interim ROD that was signed in December 2004 (Navy, 2004h).

#### 5.3.1.1 Soil

Based on the results of the HHRA completed for the BGOURI, the evaluation of the HHRA results in the BGOURI Update, and the ERA completed during the Phase II RI, the following RAOs were developed for Site 7 soil:

- Protect current receptors (construction worker and full-time employee) from incidental exposure to soil contaminated with PAHs and potentially contaminated with benzene, CB, and DCB at concentrations greater than the PRGs. The HHRA identified potential risks to full-time employees from exposure to benzo(a)pyrene in surface soil. In addition, benzo(a)pyrene was detected in subsurface soil at concentrations that exceed the Connecticut Industrial/Commercial RSR for direct exposure. The concentrations of benzene, CB, and DCB in soil will not be known until additional sampling is conducted near the septic tank.
- Protect existing groundwater quality by preventing the leaching of PAHs, benzene, CB, and DCB in soil at concentrations greater than PRGs. Available site data indicate that soil to groundwater migration of PAHs is not significant, but soil to groundwater migration of benzene, CB, and DCB may be significant.
- Protect aquatic ecological receptors by preventing the erosion of soil containing COCs at concentrations greater than PRGs. Potential risks to aquatic ecological receptors were not identified and therefore PRGs were not selected.
- Protect potential future receptors (residential use) from incidental exposure to soil contaminated with PAHs and potentially with benzene, CB, and DCB at concentrations greater than PRGs. The HHRA identified potential risks to a hypothetical future child resident from exposure to benzo(a)pyrene in soil. In addition, maximum concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene in soil exceed the Connecticut Residential RSRs for direct exposure. The concentrations of benzene, CB, and DCB in soil will not be known until additional sampling is conducted near the septic tank.

The remedial goals identified to address the RAOs associated with Site 7 soil contaminants are presented in Table 5-1 and are based on risk assessment results and the CTDEP RSRs including direct contact and groundwater protection considerations.

The selected remedy for Site 7 soil was excavation and off-site disposal for two areas adjacent to Building 325. The PAH excavation area was located near the southeastern corner of Building 325, and the benzene, CB, and DCB excavation area was located at the septic tank along the western side of Building 325. The cost of implementing the alternative was estimated at \$440,200 in the ROD. The selected remedy for Site 7 consisted of the following components:

- Finalize Delineation To determine the final horizontal and vertical extent of soil contamination at Site 7, approximately 10 soil borings will be advanced in the area of PAH-contaminated soils and approximately 5 soil borings will be advanced in the area of suspected benzene-, CB-, and DCB-contaminated soil. It is expected that two soil samples will be collected from each boring for a total of approximately 30 soil samples. These soil samples will be sent to a laboratory for analysis. The samples collected from the PAH area will be analyzed for PAHs; the remaining samples will be analyzed for VOCs. It was also expected that a sample of the contents of the septic tank will be collected and analyzed. A sampling plan will be developed to provide the details of the predesign investigation sampling program.
- Excavation Following final delineation, excavation equipment will be used to excavate the contaminated soil from Site 7 (approximately 1,600 cubic yards of PAH-contaminated soil and 90 cubic yards of benzene-, CB-, and DCB-contaminated soil and the septic tank). The excavated soil will be characterized to determine the appropriate disposal facility. Due to the depth of excavation (5 to 8 feet), it is anticipated that the excavation side walls will have to be laid back to provide for safe working conditions. Therefore, it is anticipated that approximately 200 cubic yards of additional soil outside the extent of contamination will need to be excavated to provide a safe operation. The additional soil will be disposed off site along with the contaminated soil. The total volume of soil to be excavated and disposed off site is approximately 1,900 cubic yards. Groundwater may also be encountered during excavation of contaminated soil. If encountered, the water may need to be removed from the excavation, pre-treated, and discharged to the publicly-owned treatment works (POTW).
- Transportation Upon determination of the appropriate disposal facility, the contaminated soil will be loaded into trucks for transportation to the off-site disposal or recycling center.
- Verification Sampling After the excavation of contaminated soil, soil samples will be collected from
  the bottom and sidewalls of each excavation area. The soil samples will be analyzed for their
  respective sets of COCs to verify the removal of the COCs or to verify that the remaining COC
  concentrations are less than remedial goals. Table 5-1 provides the COCs for each excavation area
  and the remedial goals for each COC. Due to the size of each excavation, it was anticipated that 10

verification samples will be collected from each excavation area. In the event that COCs remain at concentrations greater than the remediation goals, additional soil will be excavated where appropriate, and additional verification samples will be collected. The final details of the verification sampling program will be provided as part of the remedial design documentation.

Restoration - After verification that the COCs were removed from Site 7 or that COC concentrations
remaining in Site 7 soil are less than remedial goals, clean soil will be brought to the site to backfill
the excavations. Following backfilling of the excavations, the surface will be returned to preexcavation conditions (e.g., grassed, paved, or gravel).

#### 5.3.1.2 Groundwater

Based on the results of the HHRA completed for the BGOURI and the evaluation of the HHRA results in the BGOURI Update, the following RAOs were developed in the FS to address the COCs detected in groundwater at Sites 3 and 7:

- Protect current receptors (construction workers) from incidental exposure to groundwater contaminated with petroleum and chlorinated hydrocarbons at concentrations greater than PRGs.
   The HHRA did not identify excessive risk to construction workers associated with exposure to groundwater.
- Protect potential future receptors (potable water supply) from regular ingestion of groundwater contaminated with chlorinated hydrocarbons at concentrations greater than PRGs.
- Protect aquatic ecological receptors by preventing the migration of groundwater contaminated with petroleum hydrocarbons at concentrations greater than PRGs to surface water.

The following RAOs were developed to address the COCs detected exclusively at Site 7 (i.e., 1,4-DCB, benzene, and CB):

- Protect current receptors (construction workers) from incidental exposure to groundwater contaminated with organics at concentrations greater than PRGs. The HHRA did not identify excessive risk to construction workers associated with exposure to groundwater, and therefore PRGs were not selected.
- Protect potential future receptors (potable water supply) from regular ingestion of groundwater contaminated with benzene and chlorinated hydrocarbons at concentrations greater than PRGs.

 Protect aquatic ecological receptors by preventing the migration of groundwater contaminated with COCs at concentrations greater than PRGs to surface water. Potential risks to aquatic ecological receptors were not identified, and therefore PRGs were not selected.

The remedial goals identified to address the RAOs associated with Site 7 groundwater contaminants are presented in Table 5-2 and are based on risk assessment results and CTDEP RSRs.

Site 7 groundwater was not identified to represent a significant risk to current receptors or ecological receptors in adjacent water bodies. However, CB, DCB, benzene, TCE, and HCB are present in groundwater at concentrations that could represent a risk to potential future receptors through regular consumption of groundwater. The selected remedy for Site 7 groundwater was institutional controls and monitoring. It is expected that the selected remedy for groundwater will be the final remedy after remedial actions are selected for all portions of OU9. The selected remedy complies with regulatory requirements and includes the following major components:

- Implementation of institutional controls that identify the location and magnitude of groundwater contamination and restrict extraction and use of the groundwater. The details of the administration of the institutional controls will be provided in the Remedial Design documentation. In the event of property transfer and with confirmation that contaminated groundwater remains at the sites, a deed restriction would be used to prohibit the use of groundwater.
- Monitoring the degradation and potential migration of groundwater contaminants until concentrations
  decrease to the remedial goals in Table 5-2 by natural processes and the resulting concentrations are
  shown to be protective of human health and the environment. Additional details regarding the scope
  and duration of the monitoring program will be provided in the groundwater monitoring plan.

The estimated cost of the selected remedy for Site 7 groundwater in the ROD was \$303,800, which included capital, monitoring, and O&M costs. A Remedial Design for Land Use Controls was subsequently completed for Site 7 groundwater in June 2005. The Navy also prepared the Remedial Action Work Plan (TtNUS, 2006b) and Site 7 Groundwater Monitoring Plan (TtNUS, 2006a) to address implementation of the groundwater monitoring program at Site 7.

#### 5.3.2 Remedy Implementation

#### Soil

Implementation of the Site 7 soil remedial action of excavation and off-site disposal was completed in May 2006. Documentation for the remedial action is currently being prepared and was not available at the time this report was prepared.

#### Groundwater

A Remedial Design for Land Use Controls was completed for Site 7 groundwater in June 2005. The Navy incorporated the information in the Remedial Design into the New London Instruction 5090.18C (Navy, 2006b).

The objective of the Site 7 groundwater monitoring program is to conduct long-term monitoring of the degradation and potential migration of COCs until the concentrations decrease to the remedial goals by natural processes and the resulting concentrations are shown to be protective of human health and the environment. The monitoring program will continue until compliance with the remedial goals within the site boundaries is shown and it is confirmed that contamination is not migrating from the site at concentrations in excess of remedial goals. The groundwater at Site 7 is designated as GB by the State of Connecticut; however, the Navy's goal for groundwater remediation at the Site 7 is to meet GA requirements to eliminate groundwater use restrictions in the future. Based on State regulations, monitoring can be discontinued after 3 years of data that show compliance with the applicable criteria. After the monitoring program can be discontinued, the groundwater use restrictions can be eliminated, and five-year reviews will no longer be necessary at the site. Annual reports will be issued to summarize the results of the monitoring program. The annual reports will include a thorough evaluation of each year of data collected under the program.

The Navy began implementation of the groundwater monitoring program as described in the Remedial Action Work Plan (TtNUS, 2006b) and Site 7 Groundwater Monitoring Plan (TtNUS, 2006a) in May 2006. Four new monitoring wells were installed at Site 7 to complete the monitoring well network. A total of eight monitoring wells (four existing and four new) were then sampled and analyzed for VOCs under the program. Sampling will continue to be conducted quarterly for the first year of the program. The analytical program and monitoring well network will be modified as necessary in the future.

#### 5.3.3 System Operations/Operation and Maintenance

#### 5.3.3.1 Operation and Maintenance

O&M will not be required for Site 7 soil because the remedial action removed all soil with COC concentrations greater than remedial goals that allow for unrestricted use.

No O&M costs have been incurred yet for the groundwater remedy. The estimated present worth cost of groundwater monitoring activities at Site 7 for the first 5 years is \$98,600. This cost estimate was presented in the BGOURI Update/FS and assumes quarterly sampling the first year, annual monitoring the next 4 years, and minimal maintenance of the monitoring wells.

#### 5.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 7. The recommendations from the First Five-Year Review Report are provided below along with the actions taken to address the recommendations.

Prepare an NFA decision document for the soil, sediment, and surface water OUs at Site 7.

- An evaluation of soil data in the BGOURI Update/FS (TtNUS, 2004) indicated that the soil posed
  potential risks to human receptors. A Proposed Plan, ROD, and Remedial Action Work Plan were
  subsequently completed to address Site 7 soil. Implementation of the selected remedy for Site 7 soil
  (excavation and off-site disposal) was completed in May 2006.
- Surface water and sediment data from the Phase II RI did not indicate significant risks to ecological receptors. No decision document was prepared for these media.

#### Prepare an FS for the groundwater OU associated with Site 7.

An FS, Proposed Plan, Interim ROD, Remedial Design for Land Use Controls, Remedial Action Work
Plan, and Groundwater Monitoring Plan for Site 7 groundwater were completed. The Navy is
currently implementing the Remedial Action Work Plan and Groundwater Monitoring Plan.

#### Enforce of the New London Instruction 5090.18B.

The New London Instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Instruction 5090.18B). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2 - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has

been followed by personnel at NSB-NLON, and no uncontrolled disturbances of the soil or groundwater at Site 7 have occurred.

#### 5.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 5.5.1 Document Review

The documents that were reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

BGOURI	January 2002
BGOURI Update/FS	July 2004
Proposed Plan for Site 7 Torpedo Shops and Site 14 OBDANE Soil (OU8)	July 2004
ROD for Site 7 - Torpedo Shops and Site 14 – OBDANE Soil (OU8)	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater	December 2004
LUC RD for Sites 3 and 7 Groundwater	June 2005
Final O&M Manual - Volumes I and II	January 2006
Remedial Action Work Plan/Design for Site 7 Soil	February 2006
Work Plan for Remedial Action at Sites 3 and 7 (Groundwater)	March 2006
SOPA (ADMIN) New London Instruction 5090.18C	December 2006

#### 5.5.2 <u>Data Review</u>

Additional soil data were collected by Tetra Tech ECI, Inc. (TtECI, 2005) during preparation of the Remedial Action Work Plan to finalize the extent of contamination.

The latest groundwater data for Site 7 were collected during the BGOURI. These data were used to determine the remedial approach for the site. The groundwater monitoring program at Site 7 was initiated in May 2006; therefore, no new data were available for review during this Second Five-Year Review.

#### 5.5.3 ARAR and Site-Specific Action Level Changes

#### 5.5.3.1 Soil

The remedial action implemented for soil at the Torpedo Shops was excavation and off-site disposal. ARARs and TBCs were reviewed to determine whether there have been changes since the ROD was signed. Listings of chemical-specific and action-specific ARARs, advisories, and guidance (TBCs) considered in the ROD are listed on Tables 5-3 and 5-4, respectively. The ARARs were either addressed during selection or implementation of the remedy and are no longer applicable or have not been amended since the ROD.

#### 5.5.3.2 Groundwater

The remedial action implemented for groundwater at the Torpedo Shops was institutional controls and monitoring. ARARs and TBCs were reviewed to determine whether there have been changes since the ROD and Groundwater Monitoring Plan were issued. Listings of chemical-specific and action-specific ARARs, advisories, and guidance (TBCs) considered in the ROD are listed on Tables 5-5 and 5-6, respectively. The ARARs were either addressed during selection or implementation of the remedy and are no longer applicable or have not been amended since the ROD and Groundwater Monitoring Plan were issued. A Land Use Control Use Control Remedial Design was completed, and controls have been implemented through the New London Instruction 5090.18C.

#### 5.5.4 <u>Site Inspection</u>

Site 7 was inspected on April 4, 2006. The inspection focused primarily on the soil remedial action (i.e., excavations) that was being conducted at the site and the proposed monitoring well locations for the planned groundwater monitoring program. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. Site 7 is located within a high-security gated area. The area consists of buildings, parking lots, and grassy areas. There is no short-term or long-term plan to convert this area to any other use. Appendix A contains photographs taken of the site during the site inspection.

Open excavations were present to the west and south of Building 325 on the day of the inspection. Soil from these two excavations was being stockpiled on site to the west of Building 325 until confirmation and waste characterization results were available. Groundwater had filled the excavation along the western side of Building 325, and the contractor was in the process of obtaining a permit to dewater the excavation and discharge the water into the sanitary sewer.

Two of the four proposed monitoring well locations (stakes and flagging) for the groundwater monitoring program were observed at the site. The remaining two well locations will be in the vicinity of the excavation on the western side of Building 325.

#### 5.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review. Issues discussed by the inspection team during the inspection included the soil remedial action and the proposed well locations.

#### 5.6 ASSESSMENT

The following conclusions support the determination that the remedy for the Site 7 soil OU (OU8) is protective of human health and the environment and the remedy for the Site 7 groundwater OU will be protective of human health and the environment upon completion.

#### Question 1. Is the remedy functioning as intended by the decision documents?

- Remedial Action Performance: All contaminated soil in excess of remedial goals (Table 5-1) were excavated and disposed off site. The effectiveness of the remediation will be documented in the completion report. Groundwater monitoring was recently initiated at the site to monitor the natural attenuation of contaminants until they reach the selected remedial goals (Table 5-2). The groundwater water data will be summarized and evaluated in subsequent monitoring reports.
- System Operations/O&M: For the groundwater OU, four new monitoring wells were installed to complete the monitoring well network, and four existing wells were redeveloped as part of the groundwater monitoring program. Costs for groundwater monitoring at Site 7 over the first 5 years of the program were expected to range from \$ 48,300 (Year 1) to \$13,441 (Years 2 through 5). These cost estimates were presented in the FS. Because the monitoring program was initiated in May 2006, actual costs were not available at the time of preparation of this report.
- *Opportunities for Optimization:* Site 7 monitoring wells that are not being used for the monitoring program can be abandoned. The monitoring network can be reduced as necessary in the future.
- Early Indicators of Potential Remedy Failure: There are no indications of potential remedy failure.
- Implementation of Institutional Controls and Other Measures: Institutional controls associated
  with the Site 7 are discussed in the New London Instruction 5090.18C. The site is within the
  designated ESQD of the Area A Weapons Center; therefore, further development is not planned for

the area. A Land Use Control Remedial Design for Site 7 groundwater was completed, and the controls will be implemented through the New London Instruction 5090.18B.

### Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- **Changes in Standards and TBCs**: ARARs and TBCs considered during preparation of the soil and groundwater RODs were reviewed to determine if there were any changes. As presented in Section 5.5.3, there have been no changes to ARARs.
- Changes in Exposure Pathways: Because all soil with contaminant concentrations greater than remedial goals was excavated and disposed off site, the direct exposure pathway for human receptors to soil was eliminated. Groundwater at Site 7 is not currently used as a drinking water source, and municipal potable water is available at the site, which would minimize the likelihood that groundwater would be used as a drinking water source in the future.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in the human health toxicity criteria that would impact the soil or groundwater remedial goals.
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the RODs that would impact the protectiveness of the remedies.
- Expected Progress Towards Meeting RAOs: The RAOs for Site 7 soil (OU8) were met by excavating the soil with contaminant concentrations greater than the remedial goals and disposing of it at an approved off site disposal facility. RAOs for Site 7 groundwater, a portion of OU9, are in the process of being met. Land use controls and a groundwater monitoring program are currently being implemented at the site. A Remedial Design for LUCs was prepared for groundwater and was incorporated in the New London Instruction 5090.18C.

### Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the soil or groundwater remedies.

#### 5.7 ISSUES

Remedies for Site 7 soil and groundwater were recently implemented, and no documentation was available for review. Based on the limited available information, the following deficiency was identified during this review:

 New London Instruction 5090.18C was issued in 2006 and includes the latest information from the Land Use Control Remedial Design for Site 7 groundwater. The Instruction should continue to be enforced.

#### 5.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and review, the following recommendations are made for Site 7:

- Prepare and issue the completion report for the soil remedial action.
- Continue implementation of the Groundwater Monitoring Plan.
- Continue enforcement of the New London Instruction 5090.18C.
- Maintain the existing monitoring well network and/or properly abandon unnecessary monitoring wells.
- At least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews.

Follow-up actions should be implemented by the Navy in a timely manner to address the recommendations.

#### 5.9 PROTECTIVENESS STATEMENT

The soil remedy at Site 7 is currently protective of human health and the environment. Excavation and off-site disposal of soil eliminated direct contact by human and ecological receptors and prevented soil to groundwater migration issues. The groundwater remedy at Site 7 is expected to be protective of human health and the environment. Institutional controls were implemented to prevent the consumption of groundwater, and a groundwater monitoring program is being conducted to verify the protectiveness of the remedy and determine when concentrations are at levels that are protective of human health and the environment. Implementation of the controls and monitoring program until acceptable groundwater concentrations are reached will maintain the effectiveness of the remedy in the future.

#### **TABLE 5-1**

#### SUMMARY OF REMEDIAL GOALS FOR SITE 7 SOIL SITE 7 - TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Area of Concern	Chemical of Concern	Remedial Goal (mg/kg)
West of Building 325	Benzene	0.02
	Chlorobenzene	2.0
	1,4-Dichlorobenzene	1.5
South of Building 325	Benzo(a)anthracene	1.0
	Benzo(a)pyrene	1.0
	Benzo(b)fluoranthene	1.0
	Indeno(1,2,3-cd)pyrene	1.0

#### TABLE 5-2

## SUMMARY OF REMEDIAL GOALS FOR SITE 7 GROUNDWATER SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Contaminant of Concern	Remedial Goal for Protection of Future Potential Receptors <sup>(1)</sup>				
Volatile Organic Compounds					
1,4-Dichlorobenzene	75 μg/L				
Benzene	1 μg/L				
Chlorobenzene	100 μg/L				
Trichloroethene	5 μg/L				
Semivolatile Organic Compounds					
Hexachlorobenzene	1 μg/L				

<sup>1</sup> Future potential receptors consist of residents living at the site who may use groundwater as a source of potable water. Human health RGs are based on federal and State of Connecticut drinking water/groundwater quality standards.

#### **TABLE 5-3**

#### CHEMICAL-SPECIFIC ARARS AND TBCs FOR SITE 7 SOIL SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

#### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
Cancer Slope Factors (CSFs)	Not applicable	TBC	These are guidance values used in risk assessment to evaluate the potential carcinogenic or non-carcinogenic hazard caused by exposure to contaminants.	Contaminated soils were excavated and properly managed off site. The remedial action eliminated soil contamination that could adversely impact human health; therefore, this requirement is no longer applicable.
Reference Doses (RfD)	Not applicable	TBC	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazard caused by exposure to contaminants.	Contaminated soils were excavated and properly managed off site. The remedial action eliminated soil contamination that could adversely impact human health; therefore, this requirement is no longer applicable.

#### STATE OF CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Current Status/Applicability
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k - 1 thru 3	Applicable	These regulations provide specific numerical cleanup criteria for contaminants in soil. Requirements are based on groundwater in the area being classified by the State as GB.	Contaminated soils were excavated and properly managed off site. The remedial action eliminated soil contamination that could adversely impact human health; therefore, this ARAR is no longer applicable.

# ACTION-SPECIFIC ARARS AND TBCs FOR SITE 7 SOIL SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken
RCRA Subtitle C - Hazardous Waste Identification and Listing Regulations	40 CFR Parts 260-262 and 264	Relevant and Appropriate	These rules are used to identify, manage, and dispose of hazardous waste.	Excavated soils were tested for hazardous waste characteristics (i.e., TCLP criteria). Any soils that exceeded applicable limits were managed in accordance with Subtitle C regulations. Because the remedial action has been completed, this regulation is no longer applicable.
RCRA Subtitle D	40 U.S.C. 6901	Relevant and Appropriate	These are regulations that govern the disposal of non-hazardous wastes.	Excavated soils that were determined to be nonhazardous were managed in accordance with Subtitle D regulations. Because the remedial action has been completed, this regulation is no longer applicable.
Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES)	40 CFR 122 through 125, 131	Applicable	NPDES permits are required for any discharges to navigable waters. If remedial activities include such a discharge, the NPDES standards would be ARARs. Standards would be enforced through the State program.	Water management was required during soil excavation; however, the water was not discharged directly to a surface water body. Therefore, treatment in accordance with these regulations was not required. Because the remedial action has been completed, this regulation is no longer applicable.
Clean Water Act, Section 403, Pretreatment Regulations	Section 403	Applicable	General pretreatment requirements for discharge to a POTW. If remedial activities include such a discharge to the local sanitary sewer, pre-treatment standards would be ARARs. Standards would be enforced through the State program.	Water management was required during soil excavation and the water was discharged to the sanitary sewer system. Testing was done that verified treatment in accordance with these regulations was not required prior to discharge to the POTW. Because the remedial action has been completed, this regulation is no longer applicable.

# ACTION-SPECIFIC ARARS AND TBCs FOR SITE 7 SOIL SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

### STATE OF CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to be Taken
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a- 449(c) 100-102 and 104	Applicable	These sections establish standards for listing, identification, and management of hazardous waste. The standards of 40 CFR 260 to 262 and 264 are incorporated by reference.	Excavated soils were tested for hazardous waste characteristics (i.e., TCLP criteria). Any soils that exceeded applicable limits were managed in accordance with these regulations. Because the remedial action has been completed, this regulation is no longer applicable.
Solid Waste Management Regulations	RCSA § 22a- 209-1 to 15	Applicable	These sections establish standards for management of non-hazardous waste.	Excavated soils that were determined to be nonhazardous were managed in accordance with these regulations. Because the remedial action has been completed, this regulation is no longer applicable.
Connecticut Water Pollution Control Act	RCSA § 22a - 416 to 599	Applicable	These regulations govern the treatment and discharge of water into surface water bodies in the State.	Water management was required during soil excavation and the water was discharged to the sanitary sewer system. Testing was done that verified treatment in accordance with these regulations was not required prior to discharge to the POTW. Because the remedial action has been completed, this regulation is no longer applicable.

### CHEMICAL-SPECIFIC ARARS AND TBCs FOR SITE 7 GROUNDWATER SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to Be Taken
Cancer Slope Factors (CSFs)	Not Applicable	TBC	These are guidance values used in risk assessment to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and the monitoring will track contaminant migration and degradation of contaminants until concentrations are below acceptable levels.
Reference Doses (RfDs)	Not Applicable	TBC	These are guidance values used in risk assessment to evaluate the potential non-carcinogenic hazard caused by exposure to contaminants.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and the monitoring will track contaminant migration and degradation of contaminants until concentrations are below acceptable levels.

### STATE OF CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to Be Taken
Remediation Standard Regulations	CGS 22a-133k; RCSA 22a-133k - 1 thru 3	Applicable	This regulation provides specific numerical cleanup criteria for contaminants in groundwater. Requirements are based on groundwater in the area being classified by the state as GB.	The remedy of land use controls and monitoring complies with ARAR. Land use controls will prevent exposure to and use of contaminated groundwater.  Monitoring will track the location, migration, and degradation of contaminants until concentrations are below acceptable levels.

# ACTION-SPECIFIC ARARS AND TBCs FOR SITE 7 GROUNDWATER SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

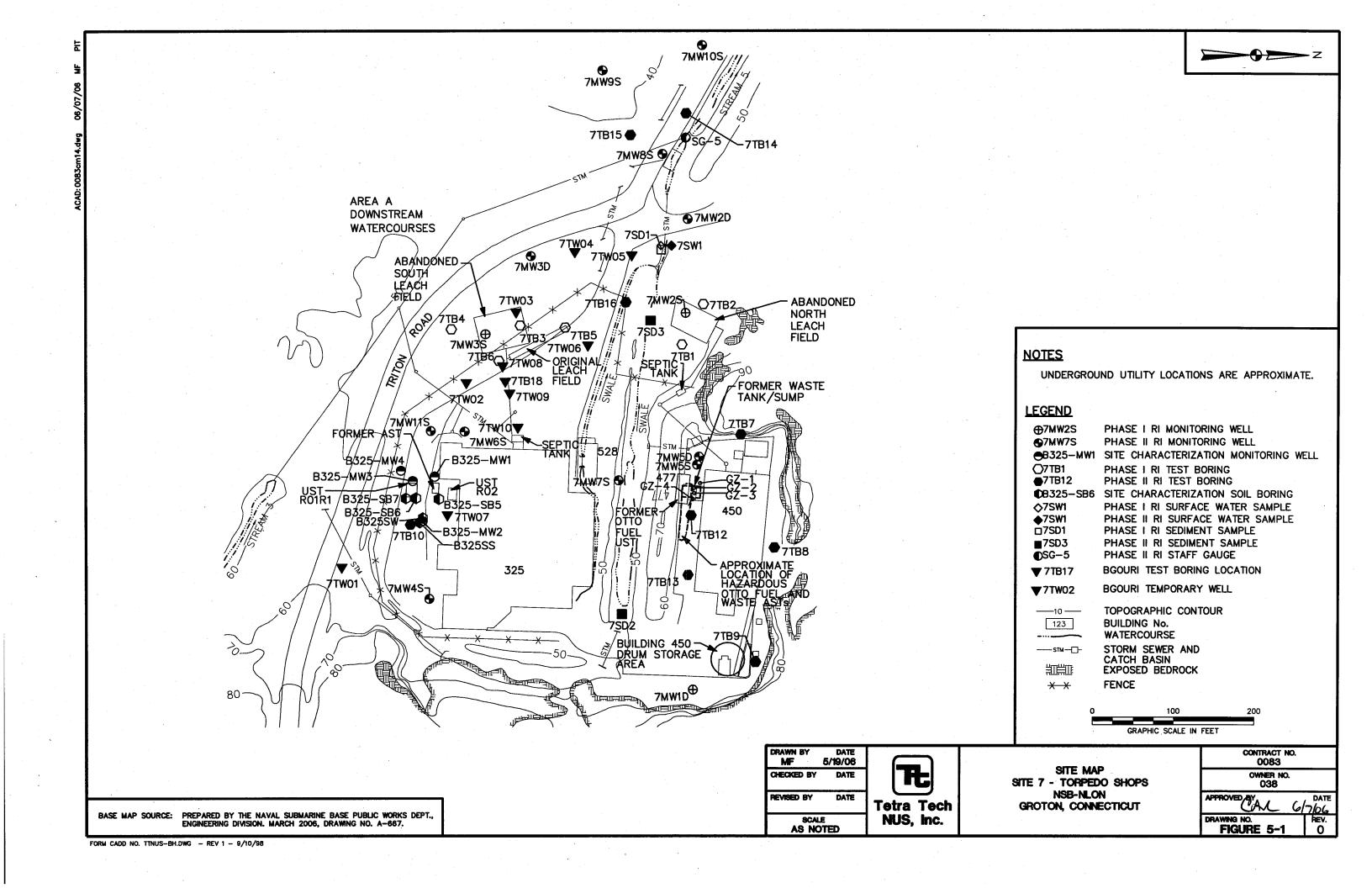
### **FEDERAL**

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to Be Taken
SDWA MCLs	42 USC 300f et. seq. 40 CFR Parts 141 to 143	Relevant and Appropriate	MCLs established under this act are health-based limits for certain chemical substances in drinking water. Site groundwater is not a current or planned future drinking water source. However, in the future, the site groundwater could be used as a potable water supply.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and monitoring will track the migration and degradation of contaminants until concentrations are less than acceptable levels.
Clean Water Act, Section 403, Pretreatment Regulations	Section 403	Applicable	General pretreatment requirements for discharge to a publicly-owned treatment works.	Groundwater extracted during groundwater monitoring activities is being tested and disposed off site. Discharge to a publicly-owned treatment works may be considered in the future for disposal of the groundwater and these requirements will be met if it is determined to be applicable.

# ACTION-SPECIFIC ARARS AND TBCs FOR SITE 7 GROUNDWATER SITE 7 – TORPEDO SHOPS NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

### STATE OF CONNECTICUT

Requirement	Citation	Status	Synopsis of Requirement	Evaluation/Action to Be Taken
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a- 449(c) 100-101	Applicable	Connecticut is delegated to administer the Federal Resource Conservation and Recovery Act statute through its state regulations. These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference.	Waste generated during the installation of monitoring wells and monitoring activities under the selected alternative was characterized for disposal and determined to be nonhazardous. These requirements are not applicable.
Hazardous Waste Management: Treatment, Storage, or Disposal Facility Standards	RCSA § 22a- 449(c) 104	Applicable	These sections establish standards for treatment, storage, and disposal facilities. The standards of 40 CFR 264 are incorporated by reference.	Waste generated during the installation of monitoring wells and monitoring activities under the selected alternative was characterized for disposal and determined to be nonhazardous. These requirements are not applicable.
Water Quality Standards	CGS 22a-426 (Connecticut General Statutes)	Applicable	These standards specify Connecticut WQSs, classifications of water of the state, and anti-degradation policies for surface water and groundwater. Groundwater at the site is classified as GB.	A remedy of land use controls with monitoring is being implemented. The controls will prevent exposure to contaminated groundwater and monitoring will track the migration and degradation of contaminants until concentrations are less than acceptable levels.



### 6.0 SITE 8 – GOSS COVE LANDFILL (OU5)

This five-year review of the Site 8 – Goss Cove Landfill is required by statute because hazardous substances, pollutants, or contaminants remain on site that do not allow for unlimited use or unrestricted exposure. A remedial action for the Site 8 soil OU (i.e., installation of an engineered cap system) was completed in June 2001. OU5 includes the soil, sediment, groundwater, and surface water at Site 8. The site has been monitored since the remedial action was completed to assess its effectiveness. As of this second five-year review, groundwater has been monitored quarterly for 4 years, and the landfill cap has been inspected annually for 3 years. Data collected during the monitoring and inspection programs are evaluated within this section.

### 6.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 8 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Landfill operations.	1946 to 1957
Final IAS completed.	March 1983
Phase I RI completed.	August 1992
Phase II RI finalized.	March 1997
Proposed Plan for soil and sediment issued.	June 1999
Public Meeting conducted.	June 1999
FS for soil and sediment issued.	September 1999
ROD for soil and sediment signed.	September 1999
Remedial Action for soil began.	September 2000
Remedial Design for soil completed.	November 2000
Final GMP for Goss Cove issued.	March 2001
Remedial Action for soil completed.	June 2001
First Five-Year Review Report completed.	December 2001
BGOURI completed.	January 2002
Groundwater Monitoring Program initiated	January 2002
Final RA Report issued.	September 2002
Draft Final O&M Manual - Volumes I, III, IV, and V completed.	September 2002
SOPA (ADMIN) New London Instruction 5090.18B issued.	February 2003
Draft O&M Manual - Volume II completed.	March 2003
Year 1 GMR issued.	August 2003
2003 Annual LIR issued.	November 2004
Year 2 GMR issued.	December 2004
Year 3 GMR issued.	August 2005

Event	Date
2004 Annual LIR issued.	September 2005
2005 Annual LIR issued.	October 2005
Final O&M Manual - Volumes I, II, III, IV and V completed.	January 2006
SOPA (ADMIN) New London Instruction 5090-18C issued.	December 2006

### 6.2 BACKGROUND

The Goss Cove Landfill (Site 8) is located in the southwestern corner of NSB-NLON, adjacent to the Thames River. It is west of Shark Boulevard and the intersection of Crystal Lake Road and Military Highway, east of the Thames River, and north of Goss Cove. Figure 6-1 displays the general site arrangement. The landfill encompasses approximately 3.5 acres. The Nautilus Museum and a paved parking lot are constructed directly over the site of the former landfill. The Nautilus Museum is a submarine museum operated by the Navy and is open to the public.

The IAS Report (NEESA, 1983) indicated that the Goss Cove Landfill was operated from 1946 through 1957. Incinerator ash and inert rubble were disposed at the site in what was then the northern portion of Goss Cove. It is not known if any other materials were disposed in the former landfill. It has been reported that several large compressed gas cylinders were uncovered during the excavation of a utility trench in the parking area north of the Nautilus Museum building. One of the cylinders was leaking propane, one was filled with ammonia, and the others were empty.

In a 1934 aerial photograph, Goss Cove appeared to be open water with no evidence of fill. Railroad tracks are shown in the photograph at the same location as they are currently, between the cove and the Thames River. In 1951 aerial photographs, the fill extended from the northern boundary south to approximately the location of an access driveway to the museum. The 1965 aerial photographs show the landfill extending to the present limit of encroachment on Goss Cove. Aerial photographs from 1965, 1970, 1975, and 1980 show cars parked on the landfill surface. In 1986 photographs, the Nautilus Museum is present on the southern limits of the landfill, and a paved parking area extends over the remaining limit of the landfill to the north. Construction of the Nautilus Museum was completed in 1985, and construction of an addition to the Nautilus Museum was completed in 2000.

The boring logs generated during construction of the Nautilus Museum indicated the presence of fill material consisting of cinders, metal, brick, glass, and sand and gravel to a depth of 15 feet. Beneath the fill is a layer of organic silt that is approximately 10 to 15 feet thick. This material is presumably the sediment bottom of the former cove. The silt is underlain by fine sand to depths ranging from 25 to 100 feet below the surface. The thickness of overburden increases from east to west, toward the Thames River.

A two-phase RI was conducted to determine the nature and extent of contamination at the Goss Cove Landfill. The Phase I RI, conducted from 1990 to 1992 (Atlantic, 1992), consisted of a soil gas survey, test borings, monitoring well installation, and soil, surface water, and groundwater sampling. Overburden monitoring wells were installed within the former landfill, and groundwater samples were collected. One surface water sample was collected in the Thames River downstream of the landfill. The RI recommended that the site proceed to Step I of the IRP and additional investigations be conducted at the site.

The Phase II RI was conducted from 1993 to 1995 (B&RE, 1997a). This investigation included the collection of surface and subsurface soil samples from well borings. Surface and subsurface soil samples were also collected from test borings. Shallow and deep monitoring wells were installed. Groundwater samples were collected from Phase I and Phase II monitoring wells during each of two rounds of sampling. Surface water and sediment samples were also collected during the Phase II RI from the perimeter of Goss Cove. Additional sediment sampling was conducted in Goss Cove to perform a supplemental toxicity identification evaluation (TIE). Three rounds of air sampling were performed, with air samples collected from within and around the Nautilus Museum.

Full-time employees, older child trespassers, construction workers, and future residents were evaluated as potential human receptors in the site-specific HHRA completed during the Phase II RI. The results of the risk assessment showed that no unacceptable human health risks are associated with exposure to various media based on exposure to average contaminant concentrations. All estimated Hazard Indices (HIs) for incidental ingestion, inhalation, and dermal contact with contaminated media were less than 1.0. All estimated incremental lifetime cancer risks (ILCRs) for these exposure routes were within the USEPA target risk range and less than the cumulative CTDEP target risk of 1.0E-05. Human health risks were also calculated under conditions involving exposure to maximum contaminant concentrations [i.e., the reasonable maximum exposure (RME) scenario] for all potential human receptors. Estimated HIs for the construction worker, older child trespasser, and future resident exceeded 1.0. Elevated risks for the construction worker were primarily attributable to tetrachloroethene (PCE) in groundwater, and risks for the future resident were primarily attributable to PCBs, arsenic, and antimony in soil. Estimated ILCRs for the full-time employee, older child trespasser, construction worker, and future resident all exceeded Connecticut's cumulative target cancer risk of 1.0E-05. Except for the construction worker, elevated risks were associated with soil ingestion resulting from exposure to PAHs and arsenic. An additional exposure route of concern was dermal contact with groundwater for the construction worker. PCE was the main contributor to the carcinogenic risks for dermal contact with groundwater. Quantitative risks associated with exposure to ambient air at the Nautilus Museum were calculated for a full-time employee under RME conditions only. The estimated HI (0.28) was significantly less than unity for a full-time employee. The cumulative ILCR (1.0E-05) was within the USEPA acceptable risk range and was equal to the CTDEP target risk value.

Results of the Phase II RI ERA, conducted on samples of surface water and sediments collected in the cove, indicated that several inorganics and organic compounds (i.e., pesticides) were found at concentrations in excess of benchmark values protective of aquatic biota, suggesting that aquatic biota inhabiting the cove could be adversely impacted. In response to the results of the studies conducted during Round I of the Phase II RI, additional sampling was conducted in Goss Cove during the supplemental ecological sampling round. The results indicated that four COCs (aluminum, copper, nickel, and heptachlor) were present in surface water at concentrations that represent a potential risk to aquatic biota. A number of chemicals also had Hazard Quotients (HQs) greater than 1.0, suggesting that benthic macroinvertebrates were potentially at risk. The results of toxicity tests confirmed that chemicals were biologically available in concentrations that could adversely impact aquatic biota. Results of the simultaneous extracted metals/acid volatile sulfide (SEM/AVS) analyses conducted to determine the biological availability of copper, cadmium, nickel, lead, and zinc, demonstrated that these five metals are not biologically available.

A DGI was conducted in January 1997 (B&RE, 1997c) to determine the source of PCE contamination detected in groundwater samples collected during the Phase II RI. The DGI concluded that the source of PCE contamination detected in groundwater is off site and upgradient of the site and is likely a neighboring dry cleaning establishment. The CTDEP conducted a Phase I/II Environmental Site Assessment of the dry cleaners in 1998 (CTDEP, 1999a). The assessment involved interviewing the operator of the dry cleaners and collecting medium-specific samples. The results of the investigation conclusively showed that the dry cleaners released PCE to the environment. This information indicates that the dry cleaner is the source of the PCE detected in downgradient groundwater at the Goss Cove Landfill.

An FS for the soil/waste and sediment at Site 8 (TtNUS, 1999d) was prepared in 1999. Additional investigations conducted as part of the FS are as follows:

- A desktop modeling effort was performed to evaluate the potential for migration of COCs from the former Goss Cove Landfill into Goss Cove. Results of this modeling effort showed that migration of COCs is unlikely to occur in the future.
- A Wetlands Functions and Values Assessment was completed to evaluate if the ecological stress in the Goss Cove water body was a result of natural conditions or due to migration of contaminants from NSB-NLON sites. This study evaluated the marginal cove vegetation in terms of its ecological

functions and values and identified the wetland species associated with the fringing belt. The results of the assessment were that the contrast between the Thames River and cove was dramatic due to the lack of tidal flushing. Although some tidal action occurs within the cove, it does not appear adequate to aid in supporting a rich, viable, intertidal algal population and invertebrate biota. This may be related to water quality because it appears that estuarine organisms can and have become established in the cove in the past but have failed to thrive.

• Because the Phase II RI ERA showed potential risks to ecological receptors from Goss Cove sediment, further investigation and evaluation of the sediment was completed. An Evaluation of Chemical and Toxicological Data study was conducted in 1998 (SAIC, 1998) to evaluate chemical and toxicological relationships for sediments in Goss Cove. The objectives of the study were to establish toxicological response relationships for contaminants in Goss Cove sediments, describe the extent of ecological risks associated with chemical contaminants in Goss Cove sediments, and identify risks for biological effects. Based on data needs, sediment samples from 10 stations were collected and chemical, toxicological, and TIE tests were performed on the samples. The study supported the conclusion that a complete pathway did not exist between contaminants and observed ecological effects. It may be possible to improve benthic habitat quality by reducing the hypoxic conditions in the cove, thereby reducing the ammonia concentrations that appear to cause the depauperate aquatic community.

The investigations showed that the contaminant levels detected in sediment and surface water in Goss Cove did not pose potential adverse risks to human health or the environment. Based on these findings, NFA was recommended for these media. The two remedial alternatives evaluated for the soil/waste in the FS were no action and installation of an engineered control cap (presumptive remedy) with institutional controls and monitoring. The capping alternative was selected for Site 8, and the ROD for this site was signed by the Navy and regulators in September 1999.

The Remedial Design for the Site 8 soil began in October 1999. Additional field work (i.e., field survey, geotechnical field investigation, and geotechnical laboratory testing program) was conducted to collect the necessary data to complete the design. The Remedial Design was finalized in November 2000 (TtNUS, 2000b), and construction of the engineered cap system was completed in June 2001.

The BGOURI was completed (TtNUS, 2002a) to further evaluate the potential risks identified in the Phase II RI associated with exposure to groundwater by human receptors. The field work for the BGOURI was completed prior to construction of the engineered cap system. Groundwater samples were collected from existing permanent monitoring wells to further characterize the site. The analytical data from the BGOURI indicate that sources of VOCs, SVOCs, and metals within the fill material are continuing to impact the

shallow groundwater at the site. It is likely that these chemicals are mobile and being transported in the groundwater to the Thames River. However, the results of the HHRA showed that all risks for construction workers exposed to groundwater at Site 8 were less than or within target risk ranges. The BGOURI recommended that the Navy complete the Remedial Action for the soil, implement land use controls, and begin groundwater monitoring in accordance with the Groundwater Monitoring Plan (TtNUS, 2001b) as soon as the action is finalized. It was recommended that the decision for preparation of an FS for groundwater at Site 8 be postponed until site conditions stabilize and trends in groundwater contaminant concentrations are determined based on results of the groundwater monitoring program.

O&M of the cap system at Site 8 is being performed in accordance with the O&M Manual for IR Program Sites (TtNUS, 2006a). The groundwater monitoring program for Site 8 began in 2001 (TtNUS, 2001a) and is ongoing (TtNUS, 2006a). The results of the program are being used to verify the effectiveness of the cap in reducing infiltration and leaching of contaminants and to confirm that contamination is not migrating from soil to groundwater and eventually to the Thames River. A remedy for Site 8 groundwater will be selected in the future.

### 6.3 REMEDIAL ACTIONS

As discussed previously, OU5 includes the soil, sediment, groundwater, and surface water at Site 8.

A ROD (TtNUS, 1999e) was signed for the soil and sediment OU at Site 8. Based on the ROD, a remedial action was required for soil, and no further action was required for sediment. The following sections describe the remedial action for soil at Site 8.

The results of the RI and FS concluded that surface water associated with Site 8 did not pose any unacceptable risks to potential human or ecological receptors. However, no decision document has been prepared to document the NFA decision for the surface water OU. This OU is not addressed in this five-year review.

The groundwater OU at Site 8 is still being investigated under CERCLA, and final recommendations for the OU will be determined when sufficient data has been collected under the groundwater monitoring program.

### 6.3.1 Remedy Selection

Based on ARARs and risk assessment results, the following RAOs were selected for soil at Goss Cove Landfill:

- Protect potential receptors (i.e., full-time employees, construction workers, older child trespassers, and future residents) from exposure to contaminated soil.
- Prevent unacceptable risk to ecological receptors in the Thames River and Goss Cove from potential migration of contaminants.

To meet the RAOs, the presumptive remedy of containment was selected for soil. The basis for use of the presumptive remedy was the guidance document entitled Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (Interim Guidance) (USEPA, 1996b). The key decision points are as follows:

- Based on the available information for Goss Cove Landfill, the waste/fill is heterogeneous, consisting of ashes, cinders, and inert debris such as glass, brick, wood, etc. The wastes are mainly non-hazardous debris, which can be considered municipal wastes. The contamination mainly consists of PAHs and inorganics that can be attributed to incomplete combustion of fossil fuel and to incinerator ash. The effectiveness of either above-ground treatment for physical separation of the wastes from the fill or in-situ treatment for removal of contaminants is limited because many different treatment processes would be required to address various heterogeneous constituents in the landfill. In addition, due to the large volume of fill material (107,000 cubic yards), such treatment would not be cost effective. As indicated by fate and transport modeling results, the contaminants from the landfill are not currently migrating via the groundwater pathway, and because a majority of the surface of the existing landfill is paved, none of the contaminants are likely to migrate via surface soil erosion.
- The landfill site is currently serving as a museum and a parking lot. The land use in the foreseeable future is expected to remain the same.
- The available historical information suggests that no military munitions were disposed at this landfill.
- The estimated volume of waste/fill, 107,000 cubic yards, exceeds 100,000 cubic yards, which is typically considered to be the limit for an excavation remedy to be suitable.

The selected remedy for the soil and waste/fill material within the Goss Cove Landfill consisted of containment using an engineered control cap, institutional controls, groundwater monitoring, O&M, and five-year reviews. The remedy also included the replacement of a storm sewer system that consisted of three 42-inch-diameter corrugated metal pipes (CMPs) that served the southern portion of NSB-NLON and the Goss Cove Landfill parking lot and surrounding area. The existing storm sewer pipes were

under-sized and in a deteriorated condition. A 4-foot by 10-foot reinforced concrete box culvert was selected for the new storm sewer system.

Under the selected remedy, the grass-covered areas around the Nautilus Museum were to be excavated and handled in accordance with all applicable environmental laws and regulations. If visual evidence or instrument readings indicated that hazardous constituents may be present, the soil was to be tested for hazardous characteristics. The excavated soil was to be spread over the landfill and compacted. The excavated area was to be backfilled and capped by the placement of a soil-type multi-layered cap consisting of the following components in ascending order: (1) a geonet gas collection layer, (2) a synthetic membrane with a maximum permeability of 10<sup>-6</sup> centimeters/second (cm/sec), (3) coarse sand for drainage, (4) a geotextile layer for separation, (5) a layer of fill as a root-penetration zone, and (6) a layer of top soil cover with vegetation. The grass islands in the parking lot were also to be capped with a similar multi-layered soil-type cap overlying the compacted layer of waste.

An asphalt-type multi-layered cap was to be placed over compacted waste in paved areas. The cap was to consist of the following components in ascending order: (1) a geonet gas collection layer, (2) a synthetic membrane having a maximum permeability of 10<sup>-6</sup> cm/sec, (3) a layer of coarse sand for drainage, (4) a geotextile layer for separation, (5) a layer of gravel sub-base, and (6) a layer of asphalt paving material. The geonet gas layer, geomembrane layer, drainage layer, and the bottom geotextile layer were to be common throughout the parking lot, including in the grass islands.

Institutional controls were to be recorded in the Base IR Instruction to restrict or control future activities at the site so that potential receptors are not adversely affected. If the Navy leases or transfers title to the property, thereby creating a lease or deed, restrictions will be included in the transfer document to notify future owners of the risk of potential exposure to the contaminants under the cap and the prohibitions on residential development or disruption of the cap. In addition, Environmental Land Use Restrictions (ELURs) would be recorded on the property according to applicable State and local requirements.

Periodic maintenance of the cap was to be performed under the selected remedy. Appropriate material components were to be included in the design of the asphalt layers to reduce the extent of reflective cracking and to minimize maintenance of the asphalt-type cap. Maintenance of the soil-type cap was to include care for the vegetation on the soil cover. Periodic grading and drainage maintenance were to be completed for both types of caps.

Finally, long-term monitoring of groundwater was to be conducted as part of the selected remedy to ensure that contaminant migration is not occurring. Five-year site reviews of the remedy were also to be completed because wastes will remain on site.

### 6.3.2 Remedy Implementation

The Remedial Design for soil at Goss Cove Landfill began in October 1999. Additional field work (i.e., field survey, geotechnical field investigation, and geotechnical laboratory testing program) was conducted to collect the necessary data to complete the design. The remedial design was completed in phases (e.g., 30%, 100%, and bidding document). The Remedial Design for the Goss Cove Landfill was finalized in November 2000 (TtNUS, 2000b). Based on comments received from the USEPA and normal refinement of details during the design, the cap components included in the final design were slightly different than the components presented in the ROD. A comparison of the components is provided below.

### **Grass-Covered Areas**

### Cap Components in ROD

- · Geonet gas collection layer
- Synthetic membrane (maximum permeability of 10<sup>-6</sup> cm/sec)
- Coarse sand drainage layer
- Geotextile layer
- Layer of fill as a root-penetration zone
- Layer of topsoil cover with vegetation

### **Cap Components in Final Design**

- Gas management layer (6-inch-thick select waste/fill and 24-ounce/square yard non-woven geotextile)
- 60-mil smooth linear low-density polyethylene (LLDPE) geomembrane
- Geosynthetic drainage layer (geonet with nonwoven geotextile on either side)
- 12-inch-thick sub-base layer
- Non-woven geotextile
- 6-inch-thick base course layer
- Non-woven geotextile
- 6-inch-thick select fill material layer
- 6-inch-thick vegetative cover layer

### **Asphalt-Covered Areas**

### Cap Components in ROD

- Geonet gas collection layer
- Synthetic membrane (maximum permeability of 10<sup>-6</sup> cm/sec)
- Coarse sand drainage layer
- Geotextile layer
- Gravel sub-base layer
- Asphalt paving material layer

### **Cap Components in Final Design**

- Gas management layer
- 60-mil smooth LLDPE geomembrane
- Geosynthetic drainage layer
- 12-inch-thick sub-base layer
- Woven geotextile
- 6-inch-thick base course layer
- 3-inch-bituminous concrete surface layer

The Navy's RAC began preliminary construction activities at the site in September 2000. The RAC completed installation of the new storm sewer system and the engineered cap system in June 2001. The

final report for the remedial action at Goss Cove Landfill was completed in 2002 (FWEC, 2002c) and includes construction details and QA/QC procedures. Some of the changes that occurred during installation of the cap and storm sewer system included changes to the supports (piles) for the box culvert, modifications to the limits of the cap system, and changes to the landscaping (sprinkler system).

To ensure the quality of the remedial action, QC testing and inspection were completed during the remedial action in accordance with the CQC Plan. One non-conformance was noted during the QC testing and inspection (i.e., the compressive strength of grout used in four pipe piles for the box culvert did not meet the required 5,000 pounds per square inch strength). Further analysis indicated that the compressive strength of the installed grout was sufficient to support the box culvert.

The Navy's cost estimate for implementation of the remedial design was approximately \$3,300,000. The approximate total cost of the remedial action was \$5,450,000. The changes in cost were associated with modifications to the storm sewer system, accelerated work schedules, and landscaping.

Other components of the remedial action, including long-term monitoring and O&M, are discussed in Section 6.3.3.

To meet the land use control requirements in the ROD, the Navy prepared and implemented an instruction to restrict use at IR sites at NSB-NLON. The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 [SOPA (ADMIN) New London Instruction 5090.18B, (Navy, 2003)]. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2 - Area A Landfill. The instruction defines the Navy's policy regarding ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

### 6.3.3 System Operations/Operation and Maintenance

### 6.3.3.1 Monitoring Program

The results of the groundwater monitoring program are being used to assess the effectiveness of the remedial action. Sampling was completed at the site in accordance with the final Groundwater Monitoring Plan for Goss Cove Landfill (TtNUS, 2001a) from the initiation of the program in January 2002 through 2005. Future sampling activities at the site will be conducted in accordance with Volume II – Groundwater Monitoring Plan of the O&M Manual (TtNUS, 2006a).

Monitoring at the Goss Cove Landfill was conducted quarterly for the first 4 years (2002 through 2005). Groundwater samples were collected at low tide to ensure that groundwater is discharging to the Thames

River. A tidal study was performed to determine optimum sampling times. The samples were analyzed for Target Compound List (TCL) VOCs, SVOCs, and pesticides/PCBs, PAHs, total and dissolved TAL metals, anions (sulfate and nitrate), and hardness. Field measurements of temperature, pH, specific conductance, dissolved oxygen, ORP, turbidity, and ferrous iron were also taken during each monitoring round. Samples collected under the new monitoring program will be analyzed for the same suite of parameters with the exception of ferrous iron, which was eliminated from the program.

Three annual reports (TtNUS, 2003c; ECC, 2004g; and ECC, 2005h) have been issued that summarize the results of the monitoring program. The annual reports include a thorough evaluation of each year of data collected under the program. Numerous round-specific reports have also been prepared to document the results of the monitoring program. The round-specific reports provide a brief screening-level assessment of the sampling round data. All of the monitoring reports have been submitted to the USEPA and CTDEP for review and comment. The results of the monitoring program during this five-year review period are discussed in Section 6.5.2.1.

### 6.3.3.2 Operation and Maintenance

The Navy issued a draft O&M Manual for the IR Program Sites at NSB-NLON, which included Goss Cove Landfill, in September 2002 (TtNUS, 2002c). Volume V of the five-volume manual included site-specific instructions for O&M activities and an inspection checklist for the Goss Cove Landfill. Due to an extended comment resolution period, O&M inspections of the Goss Cove Landfill were conducted from 2003 through 2005 (3 years) based on the draft O&M Manual. The O&M Manual was finalized in 2006 (TtNUS, 2006a), and it will provide the basis for future O&M activities at Goss Cove Landfill.

The O&M process for the site includes annual inspections, reporting of results, and correcting any identified problems. The findings of the inspections are documented in the field on inspection checklists and then summarized in Annual LIRs (ECC, 2004d; ECC, 2005k; and ECC, 2005o). The inspections of the landfill focus on institutional controls, landscaping features, cap areas, stormwater features, and maintenance. Deficiencies noted during the inspections are addressed through the preparation of a Plan of Action and then executing the Plan of Action. Typically, the inspections are conducted in the fall, and corrective actions are completed during the following summer. The results of three inspections conducted during this five-year review period are discussed in Section 6.5.2.2.

### 6.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Goss Cove Landfill. The recommendations from the First Five-Year Review Report (TtNUS, 2001c) are provided below along with the actions taken to address the recommendations.

Complete preparation of the Final Report for the Remedial Action at Goss Cove Landfill.

 The Remedial Action was completed in June 2001, and the Final Report for the Remedial Action was completed in September 2002.

Implement the Groundwater Monitoring Plan and prepare an appropriate decision document for the groundwater OU when sufficient data has been collected.

• The Final GMP was issued in March 2001, and the monitoring program was initiated in January 2002. Sampling was conducted through 2005 following the GMP. A new GMP, Volume II of the O&M Manual (TtNUS, 2006a), was prepared and issued in 2006. Future sampling will be conducted following the new GMP. By comparing the original GMP to the new plan the following changes were noted; well 8MW8S was replaced by well 8MW10S (This change was made during the Round 1 sampling effort because well 8MW8S was dry; however, the GMP was never updated), sample time adjustments have been determined relative to high and low tides, and ferrous iron was eliminated from the analyte list.

### Prepare an NFA Decision Document for the surface water OU.

An NFA Decision Document has not been prepared for the surface water OU. The Navy will prepare
a decision document for the groundwater and surface water OUs at the Goss Cove Landfill after
sufficient data have been collected under the groundwater monitoring program. It is anticipated that
the decision document will be prepared in 2007.

### Prepare and implement an O&M plan.

- A draft O&M Manual for the IR Program Sites at NSB-NLON, which included Goss Cove Landfill, was issued on September 2002. Due to an extended comment resolution period, O&M activities were conducted from 2003 through 2005 (3 years) based on the draft O&M Manual. The O&M Manual was finalized in 2006 and will provide the basis for future O&M activities at Goss Cove Landfill.
- The deficiencies noted during O&M inspections of Site 8 included problems with the perimeter fencing, deteriorated concrete curbing and submarine display support, and damage to several monitoring well road boxes. The actions taken to address the deficiencies were as follows:

- Museum staff replaced missing screen ties and a tension wire on the fence in November 2003.
   They also removed vegetation growing in the fence and adjusted and secured a mangate located along the western side.
- Repairs were made to several monitoring well road boxes in July 2005.

### Continued enforcement of New London Instruction 5090.18.

- The instruction was updated (5090.18B) to include the Goss Cove Landfill and was reissued in 2003.
   The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON.
- The instruction has been followed by personnel at NSB-NLON, and no disturbances of the soil or cap at the Goss Cove Landfill have occurred since placement of the cap.

### 6.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 6.5.1 <u>Document Review</u>

The documents reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

GMP for Goss Cove Landfill	March 2001
BGOURI	January 2002
Final Remedial Action Report	September 2002
Year 1 GMR	August 2003
2003 Annual LIR	November 2004
Year 2 GMR I	December 2004
Site Management Plan for NSB-NLON	December 2004
Year 3 GMR	August 2005
2004 Annual LIR	September 2005
2005 Annual LIR	October 2005
Final O&M Manual - Volumes I, II, and V	January 2006
SOPA (ADMIN) New London Instruction 5090.18C	December 2006

### 6.5.2 Data Review

### 6.5.2.1 Monitoring Data Review

Groundwater monitoring is being conducted as part of post-closure activities associated with Site 8 to evaluate the effectiveness of the remedial action. The monitoring program was designed to determine the following:

- The effectiveness of the remedial action in preventing the migration of COPCs at concentrations greater than monitoring criteria to underlying groundwater and surface water in the nearby cove and Thames River.
- The effectiveness of the remedial action in eliminating health risks.
- Whether the criteria used for evaluating the data have been met.
- Whether a groundwater plume exists and/or interferes with any existing use of groundwater.

The ultimate goal of the monitoring program is to show compliance with the selected monitoring criteria for those COPCs migrating or having the potential to migrate from the site. The criteria used to screen the data are a combination of site-specific and CTDEP SWPC, CTDEP volatilization criteria, federal AWQC, Connecticut WQSs, and background concentrations.

Data from Years 1 through 4 of the monitoring program are presented and evaluated in this Second Five-Year Review Report.

### Year 1

Four quarterly rounds of sampling (Rounds 1, 2, 3, and 4) were conducted during 2002 (Year 1). Figure 6-2 shows groundwater data that exceeded criteria (primary and secondary) during Year 1 of the monitoring program.

The results obtained during Rounds 1 through 4 for shallow downgradient wells indicated that five analytes [benzo(a)anthracene, phenanthrene, total and dissolved arsenic, and total lead] exceeded the primary monitoring criteria and site-specific background concentrations where applicable. Temporal plots for benzo(a)anthracene, total and dissolved arsenic, and total lead did not show any significant increasing trends in concentrations of COPCs when compared to upgradient concentrations. Shallow downgradient wells 8MW2S and 8MW3 had phenanthrene concentrations that exceeded upgradient well concentrations and concentrations in the other downgradient wells (shallow and deep) increased over time.

The results obtained during Rounds 1 through 4 for deep downgradient wells indicated that 12 analytes [benzo(a)anthracene, benzo(a)pyrene benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, phenanthrene, total and dissolved arsenic, total lead and total zinc] exceeded primary monitoring criteria and site-specific background concentrations when applicable. Temporal plots did not show any significant increasing trends in concentrations of COPCs when compared to upgradient concentrations. SVOCs and total zinc concentrations spiked during Rounds 1 and 2, but dropped thereafter.

Several COPCs are present at greater levels in upgradient wells than in downgradient wells. Those COPCs included PCE, total xylenes, BEHP, dissolved mercury, and dissolved zinc. The PCE contamination has been identified as originating from a neighboring dry cleaning establishment (B&RE, 1997b and CTDEP, 1999).

### Year 2

Four quarterly rounds of sampling (Rounds 5, 6, 7, and 8) were conducted during 2003 (Year 2). Figure 6-3 shows groundwater data that exceeded criteria (primary and secondary) during Year 2 of the monitoring program.

The results obtained during Rounds 5 through 8 for shallow downgradient wells indicated that 15 analytes [4,4'-DDD, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-cd)pyrene, phenanthrene, total and dissolved arsenic, total lead, total and dissolved copper, and total mercury] were detected in shallow downgradient wells at concentrations that exceeded the monitoring criteria. A statistical analysis of upgradient and downgradient results indicated that there are 10 COPCs (total xylenes, benzo(b)fluoranthene, carbazole, fluoranthene, phenanthrene, pyrene, total and dissolved arsenic, total lead, and total mercury) with shallow downgradient concentrations that were statistically greater than upgradient concentrations. Of these 10 COPCs, four (phenanthrene, total arsenic, dissolved arsenic, and total lead) were detected at concentrations greater than primary criteria, two [benzo(a)fluoranthene and total mercury] were detected at concentrations greater than secondary criteria, and four (total xylenes, carbazole, fluoranthene, and pyrene) were detected at concentrations less than both criteria.

The results obtained during Rounds 5 through 8 for deep downgradient wells indicated that five analytes (PCE, chrysene, phenanthrene, and total and dissolved arsenic) were detected in deep downgradient wells at concentrations greater than monitoring criteria. Seven COPCs (total xylenes, chrysene, fluoranthene, phenanthrene, pyrene, total arsenic, and dissolved arsenic) were determined to have deep downgradient results statistically greater than upgradient concentrations. Of these seven COPCs, three (phenanthrene, total arsenic, and dissolved arsenic) were detected at concentrations greater than primary

criteria, one (chrysene) was detected at concentrations greater than secondary criterion, and three (total xylenes, fluoranthene, and pyrene) were detected at concentrations less than both criteria.

Temporal plots were generated for the six COPCs (PCE, phenanthrene, total and dissolved arsenic, and total and dissolved copper) that were detected at concentrations greater than primary monitoring criteria to evaluate contaminant trends. In general, the plots did not indicate significant increases in concentration over the first 2 years of monitoring. PCE concentrations appeared to be stable and attributable to a former neighboring dry cleaning facility. Phenanthrene concentrations have spiked several times, but a general trend is not pronounced. Plots of concentrations of metals in shallow downgradient wells appear to show a slightly increasing trend. Conversely, metals concentrations in deep downgradient wells appears to be decreasing significantly.

### Year 3

Four quarterly rounds of sampling (Rounds 9, 10, 11, and 12) were conducted during 2004 (Year 3). Figure 6-4 shows groundwater data that exceeded criteria during Year 3 of the monitoring program. The criteria used to evaluate the monitoring data were changed after Round 11 from the criteria in the GMP (TtNUS, 2001) to the criteria in the draft O&M Manual (TtNUS, 2003). The change in criteria significantly reduced the amount of PAHs identified as COPCs in Round 12.

The results obtained during Rounds 9 through 12 for shallow downgradient wells indicated that 15 analytes [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, total antimony, total and dissolved arsenic, total and dissolved copper, and total mercury] were detected in shallow downgradient wells at concentrations that exceeded monitoring criteria. Statistical analysis of the exceedances indicated that shallow downgradient results were statistically higher than upgradient results for two COPCs (fluoranthene and dissolved arsenic). Of these, one COPC (fluoranthene) exceeded the secondary monitoring criterion but was less than the primary monitoring criterion, and one COPC, dissolved arsenic, had concentrations that exceeded both of the respective monitoring criteria. Total antimony was detected at levels greater than the background concentration but less than primary and secondary criteria.

The results obtained during Rounds 9 through 12 for deep downgradient wells indicated that 10 analytes [benzo(a)anthracene, chrysene, phenanthrene, total and dissolved arsenic, total copper, total lead, total nickel, and total and dissolved zinc) were detected in deep downgradient wells at concentrations greater than monitoring criteria. Statistical analysis of the exceedances indicated that deep downgradient results were statistically greater than upgradient results for three COPCs (total arsenic, dissolved arsenic, and dissolved zinc). Of these, one COPC (dissolved zinc) exceeded the secondary monitoring criterion but

was less than the primary monitoring criterion, and total and dissolved arsenic had concentrations that exceeded both of the respective monitoring criteria.

In general, trend plots do not indicate significant increases in concentrations over the first 3 years of monitoring. PCE concentrations appear to be stabilized and have been attributed to a former neighboring dry cleaning facility (CTDEP, 1999). Arsenic concentrations in shallow downgradient wells appear to be increasing slightly. Plots of arsenic concentrations in deep downgradient wells appear to be decreasing.

### Year 4

Four quarterly rounds of sampling (Rounds 13, 14, 15, and 16) were conducted during 2005 (Year 4). The final results for all Year 4 sampling rounds were not available at the time this report was prepared. Figure 6-5 is a tag map that shows groundwater data that exceeded criteria during Rounds 13 and 14 of the monitoring program (ECC, 2005I; ECC 2006c). Additional information regarding the Year 4 monitoring results will be presented in the next five-year review.

### 6.5.2.2 O&M Data Review

Inspections are being conducted as part of post-closure O&M activities associated with Site 8. The goal of the inspections is to determine if appropriate O&M is being performed to maintain the effectiveness of the remedial action. As indicated in the table below, three inspections have been performed at Site 8 since the cap system was installed. All of the inspections were performed during the period being evaluated in this second five-year review. The findings of the annual inspections are summarized below.

Year	Date of Initial Inspection	Date of Supplemental Inspection	Final Report Date
2003	June 4, 2003	November 4, 2003	November 2004
2004	December 29,2004	April 26, 2005	September 2005
2005	October 11, 2005	NA	October 2005

NA - Not Applicable

### 2003

A copy of the completed 2003 Inspection Checklist for Goss Cove Landfill is provided in Appendix A. The inspection showed that the landfill was in very good condition due to proper maintenance and upkeep, was functioning as designed, and was meeting the long-term remedial objectives. The inspection identified the following minor deficiencies:

- Several fencing locations were missing screen ties or had loose or missing upper tension wire.
- Vegetation growing in the perimeter fence.
- Locations of damaged concrete curbing (northeastern portion of the parking lot) and spauling concrete (southwest submarine display).
- Invasive weeds in grassed areas.
- Debris in the floating debris boom around the box culvert discharge.
- Misaligned or dragging gates in perimeter fencing.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. Corrective actions were implemented to address the deficiencies and are discussed in Section 6.4. The corrective actions were implemented by November 2003. Corrective actions included replacing missing screen ties and tension wire and debris and weed removal. Concrete repair would be for aesthetic purposes only, and gates are functional.

### 2004

A copy of the completed 2004 Inspection Checklist for Goss Cove Landfill is provided in Appendix A. The inspection showed that the landfill was in very good condition due to proper maintenance and upkeep, was functioning as designed and meeting the long-term remedial objectives. The inspection identified the following minor deficiencies:

- Several fencing locations were missing screen ties or loose or missing upper tension wire.
- Vegetation growing in the perimeter fence.
- Locations of damaged concrete curbing (northeastern portion of parking lot) and spauling concrete (southwest submarine display).
- Misaligned or dragging gates in perimeter fencing.
- The covers for several well road boxes are unable to be secured due to damage and/or missing bolts, likely due to snow plowing.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. Fence repairs were performed by the museum staff, and the museum staff was notified regarding the spauling concrete on a display. Gates are functional. Road boxes for 8MW2S, 8MW2D, and 8MW6D were replaced in July 2005.

In addition, a video inspection of the Goss Cove box culvert was performed on August 6, 2004 by Universal Inspection Services. The video inspection concluded that the culvert appeared to be in overall good condition (ECC, 2005e).

### 2005

A copy of the completed 2005 Inspection Checklist for Goss Cove Landfill is provided in Appendix A. The inspection showed that the landfill was in very good condition due to proper maintenance and upkeep, was functioning as designed, and was meeting the long-term remedial objectives. The inspection identified the following minor deficiencies:

- The concrete circular pad near the Missile Hatch Display presents a tripping hazard.
- Irrigation system pipes and sprinkler heads are exposed and damaged.
- Sediment has accumulated in catch basins, and leaf litter and grass has accumulated in yard drains.
- Well 8MW10S is buried under loam; well 8MW9S is in a depression in the road; well 8MW1S is missing one bolt (broken box); and well 8MW4 is missing both bolts (broken box).
- All gas vents need screens, Gas Vents L and M need gate locks, and there is invasive vegetation on the Gas Vent M enclosure fencing.

A Plan of Action was prepared to document the steps to be taken to address the identified deficiencies. It is expected that the corrective actions will be implemented during the summer of 2006.

### 6.5.3 ARAR and Site-Specific Action Level Changes

The remedial action implemented for soil at the Goss Cove Landfill includes an engineered cap system, land use controls, groundwater monitoring, and O&M. ARARs and TBCs were reviewed to determine whether there have been changes since the Remedial Design Report and final Groundwater Monitoring Plan were issued. Listings of chemical-specific, location-specific, and action-specific ARARs, advisories and guidance (TBCs) that were considered in the ROD are listed in Tables 6-1, 6-2, and 6-3, respectively. With the exception of monitoring criteria, the ARARs have not been amended since the remedial design and final Groundwater Monitoring Plan. Changes associated with monitoring criteria are addressed in the response to Question 2 of Section 6.6.

Investigations/assessments showed that contaminant levels detected in sediment and surface water in Goss Cove did not pose potential adverse risks to ecological receptors. Site soils were capped, which eliminated the exposure pathway to ecological receptors. Therefore, any changes in the ecological soil screening values would not impact the effectiveness of the remedial action.

### 6.5.4 Site Inspection

The Goss Cove Landfill was inspected on April 3 and 4, 2006. The focus of the inspection was on the engineered cap system installed over the Goss Cove Landfill. TtNUS did a preliminary inspection of the site on April 3, 2006 when weather conditions were sunny and pleasant. Weather conditions during the inspection on April 4, 2006 were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection on April 4, 2006. Photographs taken of site features during the inspection are provided in Appendix B. The site inspection checklist completed during the inspection is provided in Appendix C.

The site inspection included visual observations of the current condition of the engineered landfill cap system at Site 8. During the site inspection, the team found that the land use for the site has remained unchanged since the remedial action. The Navy has continued to use the area for public vehicle parking. Signs were noticed during the inspection at the entrances to the site, warning that access is only for authorized users and personnel should not dig at the site. In general, the site inspection found that the cap system was working as intended, and that overall, the site is in very good condition. The Navy has implemented an O&M program for Site 8 and corrective actions have been taken to correct the problems that were identified. Minor items were identified during the site inspection that should be addressed but they should not affect the long-term performance of the cap system. These items are noted in the site inspection checklist provided in Appendix C. The items and their potential long-term impacts on the cap system are summarized as follows:

- The gas vents do not have screens on them. The screens will prevent habitation of animals in the vents and prevent unwanted material (e.g., trash) from being deposited in them. The two gas vents that have gates require gate locks.
- The sprinkler system is exposed and is in disrepair. It should be determined whether or not the sprinkler system is used. If used, the sprinkler system should be repaired.
- The road box cover for well 8MW5S is missing a bolt. The road box cover/bolt should be replaced so the well can be secured.
- New internal locking style caps should be installed on all wells.

- Well 8MW10S is buried under loam and needs to be located and/or replaced. Well 8MW9S is located
  in a depression in the road and should be repaired or abandoned as appropriate.
- Cleanup of vegetation and drain debris is needed.
- The hazardous material storage cabinets in the northern storage area are not kept locked. To
  prevent unauthorized use or accidents, they should be locked when not being used.
- No signs are posted at the entrance of Site 8 that warn that a cap is in place and no digging is allowed.

### 6.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second five-year review. Relevant discussions with the inspection team regarding the site included the following:

- A video inspection or other inspection of the drain pipes leading to the box culvert.
- Permanganate injection treatments have been performed by others at the former Fusconi Dry Cleaners to treat PCE. Soil and groundwater monitoring are ongoing to determine the success of injections. The CTDEP will provide additional progress reports and data to the Navy in the future.

### 6.6 ASSESSMENT

The following conclusions support the determination that the remedy for the Goss Cove Landfill is currently protective of human health and the environment.

### Question 1. Is the remedy functioning as intended by the decision documents?

Landfill and is currently effective in limiting direct exposure to contaminated soil and minimizing contaminant migration from the site. A groundwater monitoring program is being conducted to evaluate the cap's performance regarding minimizing contaminant migration. The data do not indicate any significant contaminant migration concerns related to the landfill; however, significant contamination (PCE) appears to be migrating on site from an upgradient, off-base source. The CTDEP is addressing the source area of the PCE contamination. They completed injection of an insitu chemical oxidation agent (permanganate) into the source area and are currently monitoring soil and groundwater concentrations. If future groundwater data from the Goss Cove Landfill indicate the need to evaluate additional remedial actions at some point in the future, the Navy will perform the

evaluation at that time. O&M of the cap system began in 2003, and annual maintenance is being performed to maintain proper long-term performance of the cap system.

• System Operations/O&M: Installation of the engineered cap system was completed in June 2001. An O&M Manual was developed in 2003, and an O&M program was implemented the same year. The cap system is still functioning as intended, and O&M of the cap system is being performed annually at the site. The items noted in Section 6.5.4 should be addressed to improve the O&M of the site.

Actual costs for the monitoring program have ranged from approximately \$168,600 per year to \$191,700 per year (see table below). These costs include the costs associated with sampling, analysis, validation, and reporting. Costs associated with preparing and updating the Monitoring Plan and maintaining the groundwater monitoring wells are not included in the costs.

Source	Cost of Monitoring
Projected Annual Cost in ROD	\$20,000
Actual Year 1 Cost (2002)	\$173,300
Actual Year 2 Cost (2003)	\$168,600
Actual Year 3 Cost (2004)	\$174,100
Actual Year 4 Cost (2005)	\$191,700

O&M of the cap system began in 2003, and costs have ranged from approximately \$13,100 to \$21,000 per year (see table below). Costs have fluctuated due to the amount of maintenance required and the amount of funding available. The annual O&M costs include the costs for landfill inspections, reporting, and maintenance.

Source	Cost of O&M
Projected Annual Cost in ROD	\$7,400 per year plus \$21,500 every 5 years for five-year reviews
Actual Year 1 Cost (2003)	\$13,100
Actual Year 2 Cost (2004)	\$20,300
Actual Year 3 Cost (2005)	\$21,000

Opportunities for Optimization: The sampling frequency of the monitoring program has been
quarterly for 4 years. The monitoring results have generally been consistent over the 4 years, and
sufficient baseline data have been collected to characterize the site. Therefore, the monitoring
frequency should be reduced to annually. In addition, the monitoring results have shown that

pesticides and PCBs are not a significant concern in the groundwater at Site 8; consequently, these parameters should be eliminated from the analytical program.

- Early Indicators of Potential Remedy Failure: Minor deficiencies were noted during the O&M inspections of the cap system. The deficiencies do not compromise the protectiveness of the remedy, and it is unlikely that they would contribute to remedy failure in the future.
- Implementation of Institutional Controls and Other Measures: Institutional controls associated with the Goss Cove Landfill are being implemented in accordance with New London Instruction 5090.18C. Fencing is in place around the site. These controls meet the intent of the Access Restriction RAO. However, signs are not posted at the entrance of Site 8 that warn a cap is in place and no digging is allowed.

### Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the ROD were reviewed to determine changes since the remedial design and Final Groundwater Monitoring Plan were issued. As presented in Section 6.5.3 there have been no changes to currently relevant ARARs with the exception of monitoring criteria.

The primary monitoring criteria for the Goss Cove Landfill are site-specific SWPC and CTDEP SWPC. As discussed in Section 1.4, the CTDEP SWPC were updated in April 1999 and the SWPC for the COCs at the Goss Cove Landfill were updated in 2006 (Table 6-4). The secondary monitoring criteria for the Goss Cove Landfill are the lesser of the federal AWQC and the Connecticut WQSs. The federal AWQC were last updated in 2006, and the Connecticut WQSs were last updated in December 2002. A comparison of the old and new secondary criteria is presented in Table 6-5. The changes in the AWQC and WQS do not impact the protectiveness of the remedy.

- Changes in Exposure Pathways: There have been no changes at the site that would have resulted in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in human health toxicity criteria that would impact the primary or secondary monitoring criteria.

- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the ROD that would impact the protectiveness of the remedy.
- Expected Progress Towards Meeting RAOs: The RAOs for the soil at Goss Cove Landfill were
  met by installing and maintaining the engineered cap and conducting groundwater monitoring. RAOs
  for the groundwater at Goss Cove Landfill will be defined in the future.

### Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

### 6.7 ISSUES

A few minor O&M deficiencies were noted during the five-year review site inspection that should be resolved. The deficiencies are presented in Sections 6.5.4 and summarized in Table 6-6.

### 6.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Based on the results of the site inspection and review, the following recommendations are made for Site 8.

- Continue O&M of the site and address the O&M deficiencies noted in Sections 6.5.2.2, 6.5.4, and 6.7
  (e.g., repair damaged road boxes found at wells 8MW1 and 8MW4 and extend well 8MW10S to the
  ground surface or install a replacement well).
- Install screens on every gas vent and add a lock on the gates at Gas Vents M and L.
- Continue the groundwater monitoring program, but reduce the sampling frequency to annually and
  optimize the analytical parameter list, as appropriate. Develop and implement a well abandonment
  program to eliminate wells that are no longer required for the monitoring program (e.g., 8MW4S,
  8MW8S, and 8MW9S).
- Conduct an inspection of the drains leading into the box culvert (video or by other means).

- Select an appropriate remedial action for the groundwater OU and document the remedy in a Proposed Plan and ROD.
- Continue enforcement of New London Instruction 5090.18C and add signs to the entrance gate that warn about the cap and the restrictions on digging at the site.
- At least yearly monitoring of Institutional Control compliance with the monitoring reports incorporated into future five-year reviews.
- Amend O&M Manual to remove federal AWQC.

Follow-up actions should be completed by the Navy in a timely manner to address the recommendations.

### 6.9 PROTECTIVENESS STATEMENT

The remedy at the Goss Cove Landfill is currently protective of human health and the environment. The source of contamination is contained. The engineered cap system minimizes infiltration and subsequent contaminant migration and prevents direct contact with soil. A groundwater monitoring program is being implemented to verify that the cap is performing as designed, and the results of the program suggest that the cap is performing as planned. Continued implementation of land use controls and O&M will maintain the effectiveness of the remedy into the future

### CHEMICAL-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
FEDERAL				
EPA Human Health Cancer Slope Factors (CSFs)	NA	TBC	CSFs are guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure.
EPA Reference Dose (RfDs)	NA	TBC	RfDs are guidance values use to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	The selected remedy prevents exposure to contaminated media and thereby minimizes human health concerns, although any changes to the cap in the future could allow exposure.
STATE OF CONNECTICE	JT			
Remediation Standard Regulations	RCSA Section 22a-133k-1 through 3 (Established pursuant to CGS Section 22a-133k)	Applicable	These regulations provide specific numeric cleanup criteria for a wide variety of contaminants in soil, groundwater, and soil vapor. The regulations include a procedure for establishing criteria where none exist for a particular contaminant and for establishing criteria where those specified in the regulation are not appropriate.	The selected remedy complies with these standards because of employment of the engineered control. Changes in action levels for groundwater are addressed in Section 6.6.

NA – Not Applicable

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
FEDERAL				
Executive Order 11988 RE: Floodplain Management	Executive Order 11988	Applicable	Requires federal agencies, wherever possible, to avoid or minimize adverse impacts to floodplains. Requires reduction of risk of flood loss, minimization of the impact of floods on human safety, health and welfare, and restoration and preservation of natural and beneficial values of floodplains.	Measures were taken to minimize impacts to Thames River floodplain during remedial activities. Remedial activities did not take place during periods of flooding. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
Fish and Wildlife Conservation Act	16 USC Part 661 et seq.; 40 CFR Section 6.302	Potentially Applicable	Requires action to be taken to protect fish and wildlife from projects affecting streams or rivers.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
Coastal Zone Management Act	16 USC Parts 1451 et seq.	Applicable	This act requires that any actions must be conducted in a manner consistent with State-Approved management programs.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.

# LOCATION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability
STATE OF CONNECT	ICUT			
Coastal Management Act	CGS 22a-90 to 112	Relevant and Appropriate	Requires facilities conducting activities within the coastal zone to submit a coastal site plan to the municipality. The municipality uses the coastal site plan to determine whether the proposed activity poses unacceptable impact on coastal resources and future water-dependent activities. The municipality may require that all reasonable measures be taken to mitigate such adverse impacts.	Extraction/capping was conducted using approved management programs to minimize impacts to the Thames River. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.
Connecticut Endangered Species Act	CGS 26-303 to 314	Relevant and Appropriate	Regulates activities affecting Statelisted endangered or threatened species or their critical habitat.	The State-threatened Atlantic Sturgeon inhabits the Thames River. Excavation/capping activities were conducted with minimal impact on the Thames River and any potential habitats. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability	
FEDERAL	FEDERAL				
Clean Water Act, Section 402, National Pollution Discharge Elimination System (NPDES)	40 CFR 122 through 125, 131	Applicable	NPDES permits are required for any discharges to navigable waters. If remedial activities include such a discharge, the NPDES standards would be ARARs.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
STATE OF COM	STATE OF CONNECTICUT				
Hazardous Waste Management: Generator and Handler Requirements	RCSA § 22a- 449(c) 100-101	Relevant and Appropriate	These sections establish standards for listing and identification of hazardous waste. The standards of 40 CFR 260-261 are incorporated by reference.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Hazardous Waste Management: Generator Standards	RCSA § 22a- 449(c)-102	Applicable	This section establishes standards for various classes of generators. The standards of 40 CFR 262 are incorporated by reference. Storage requirements given at 40 CFR 265.15 are also included.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Closing of Solid Waste Facilities	RCSA § 22a-209- 13	Relevant and Appropriate	This section establishes standards for closure of solid waste facilities.	This regulation was addressed during construction. These regulations have not been amended since 1996; therefore compliance is current.	

# ACTION-SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, ADVISORIES, AND GUIDANCE SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

Requirement	Citation	Status	Requirement Synopsis	Current Status / Applicability	
STATE OF CONNECTICUT (Continued)					
Air Pollution Control	RCSA § 22a-174- 1 through 29	Applicable	These regulations require permits to construct and to operate specified types of emission sources and contain emission standards that must be met prior to issuance of a permit. Pollutant abatement controls may be required. Specific standards pertain to fugitive dust (18b) and control of odors (23).	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Guidelines for Soil Erosion and Sediment Control	The Connecticut Council on Soil and Water Conservation	TBC	The guidelines provide technical and administrative guidance for the development, adoption, and implementation of erosion and sediment control program.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Water Pollution Control	RCSA § 22a-430- 1 through 8	Applicable	These rules establish permitting requirements and criteria for water discharge to surface water.	This regulation was addressed during construction. Now that cap construction has been completed, these requirements are applicable to future operation and maintenance of the remedy.	
Water Quality Standards	CGS 22a-426	Applicable	Connecticut's Water Quality Standards establish specific numeric criteria, designated uses, and anti-degradation policies for groundwater and surface water.	Remedial activities, including the disposal of groundwater from excavations, were undertaken in a manner that was consistent with the antidegradation policy in the Water Quality. Standards are currently being used to evaluate monitoring results to determine if further remedial action is required to protect resources. Changes in groundwater quality criteria are addressed in Section 6.6.	

TABLE 6-4

# COMPARISON OF PRIMARY MONITORING CRITERIA SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 2

		Monitoring Criteria				
Chemical	Site-Specific SWPC <sup>(1,2)</sup>		CTDEP SWPC <sup>(3)</sup>		CTDEP Volatilization <sup>(4)</sup>	
	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>
VOCs (μg/L)						
Methylene Chloride	NA	108,100	48,000	48,000	50,000	2,200
Tetrachloroethene	88	2,040	88	88	3,820	810
Xylenes	NA	NA	NA	NA	50,000	48,000
SVOCs (μg/L)						
Benzo(a)anthracene	0.3	113	0.3	0.3	NA	NA
Benzo(a)pyrene	0.3	11.3	0.3	0.3	NA	NA
Benzo(b)fluoranthene	0.3	113	0.3	0.3	NA	NA
Benzo(g,h,i)perylene	0.3	1,130	NA	NA	NA	NA
Benzo(k)fluoranthene	0.3	113	0.3	0.3	NA	NA
Bis(2-ethylhexyl)phthalate	59	1,360	59	59	NA	NA
Carbazole	29	NA	NA	NA	NA	NA
Chrysene	0.3	1130	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	2.3	NA	NA	NA	NA
Fluoranthene	3,700	294	3,700	3700	NA	NA
Indeno(1,2,3-cd)pyrene	0.3	113	NA	NA	NA	NA
Phenanthrene	0.3	11,300	0.077	0.3	NA	NA
Pyrene	110,000	11,300	110,000	110,000	NA	NA
Pesticides/PCBs (μg/L)						
4,4'-DDD	NA	0.193	NA	NA	NA	NA
4,4'-DDE	NA	0.136	NA	NA	NA	NA
4,4'-DDT	NA	0.136	NA	NA	NA	NA
Aldrin	NA	0.0322	NA	NA	NA	NA
Aroclor-1248	NA	0.0391	0.5	0.5	NA	NA
Aroclor-1254	NA	0.0391	0.5	0.5	NA	NA
Aroclor-1260	NA	0.0391	0.5	0.5	NA	NA
Dieldrin	NA	0.0322	0.1	0.1	NA	NA
Heptachlor	NA	0.0483	0.05	0.05	NA	NA

#### TABLE 6-4

# COMPARISON OF PRIMARY MONITORING CRITERIA SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 2

			Monitoring Criteria				
Chemical	Site-Speci	Site-Specific SWPC <sup>(1,2)</sup>		CTDEP SWPC(3)		CTDEP Volatilization <sup>(4)</sup>	
	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>	2001 <sup>(1)</sup>	2006 <sup>(2)</sup>	
Inorganics (μg/L)	-						
Antimony	86,000	989,000	86,000	86,000	NA	NA	
Arsenic	4	4.83	4	4	NA	NA	
Beryllium	NA	29.9	4	4	NA	NA	
Cadmium	6	2,140	6	6	NA	NA	
Copper	48	713	48	48	NA	NA	
Lead	13	1,860	13	13	NA	NA	
Mercury	NA	216	0.4	0.4	NA	NA	
Nickel	880	1,890	880	880	NA	NA	
Vanadium	NA	NA	NA	NA	NA	NA	
Zinc	123	18,600	123	123	NA	NA	

#### Notes:

NA - Not available.

SWPC - Surface water protection criteria.

CTDEP - Connecticut Department of Environmental Protection.

- 1 Groundwater Monitoring Plan for Goss Cove Landfill (TtNUS, March 2001).
- 2 Operation and Maintenance Manual for Installation Restoration Program Sites (TtNUS, January 2006).
- 3 SWPC for substances in groundwater (CTDEP, 1996).
- 4 Industrial/commercial volatilization criteria for groundwater (CTDEP, 1996, 2003).

Shading indicates that the criteria has changed.

#### **TABLE 6-5**

# COMPARISON OF SECONDARY MONITORING CRITERIA SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

	CTDEP WQSs <sup>(1)</sup>				
Chemical	Aquatic Life <sup>(3)</sup>		Human Health <sup>(2)</sup>		
	2001 <sup>(4)</sup>	2006 <sup>(5)</sup>	2001 <sup>(4)</sup>	2006 <sup>(5)</sup>	
VOCs (μg/L)	•	•		•	
Methylene Chloride	NA	470	1,600	470	
Tetrachloroethene	NA	8.85	8.85	8.85	
Xylenes	NA	NA	NA	NA	
SVOCs (μg/L)					
Benzo(a)anthracene	NA	NA	0.031	0.49	
Benzo(a)pyrene	NA	NA	0.031	0.049	
Benzo(b)fluoranthene	NA	NA	0.031	0.49	
Benzo(g,h,i)perylene	NA	NA	0.031	4.92	
Benzo(k)fluoranthene	NA	NA	0.031	0.49	
Bis(2-ethylhexyl)phthalate	NA	NA	5.9	5.9	
Carbazole	NA	NA	NA	NA	
Chrysene	NA	NA	0.031	4.92	
Dibenzo(a,h)anthracene	NA	NA	0.031	0.01	
Fluoranthene	NA	NA	370	1.28	
Indeno(1,2,3-cd)pyrene	NA	NA	0.031	0.49	
Phenanthrene	NA	NA	0.031	49.17	
Pyrene	NA	NA	11000	49.17	
Pesticides/PCBs (μg/L)	•		-		
4,4'-DDD	NA	NA	0.00084	0.00084	
4,4'-DDE	NA	NA	0.00059	0.00059	
4,4'-DDT	0.001	0.001	0.00059	0.00059	
Aldrin	NA	NA	0.00014	0.00014	
Aroclor-1248	NA	0.03	NA	0.00017	
Aroclor-1254	NA	0.03	NA	0.00017	
Aroclor-1260	NA	0.03	NA	0.00017	
Dieldrin	0.0019	0.0019	0.00014	0.00014	
Heptachlor	0.0036	0.0036	0.00021	0.00021	
Inorganics (μg/L)					
Antimony	NA	NA	4,300	4,300	
Arsenic	36	36	0.14	0.021	
Beryllium	NA	NA	0.13	0.13	
Cadmium	9.3	9.3	170	10,769	
Copper	2.4	3.1	NA	NA	
Lead	8.1	8.1	NA	NA	
Mercury	0.025	0.94	0.15	0.051	
Nickel	8.2	8.2	4,600	4,600	
Vanadium	NA	NA	NA	NA	
Zinc	81	81	NA	68,740	

# Notes:

NA - Not available.

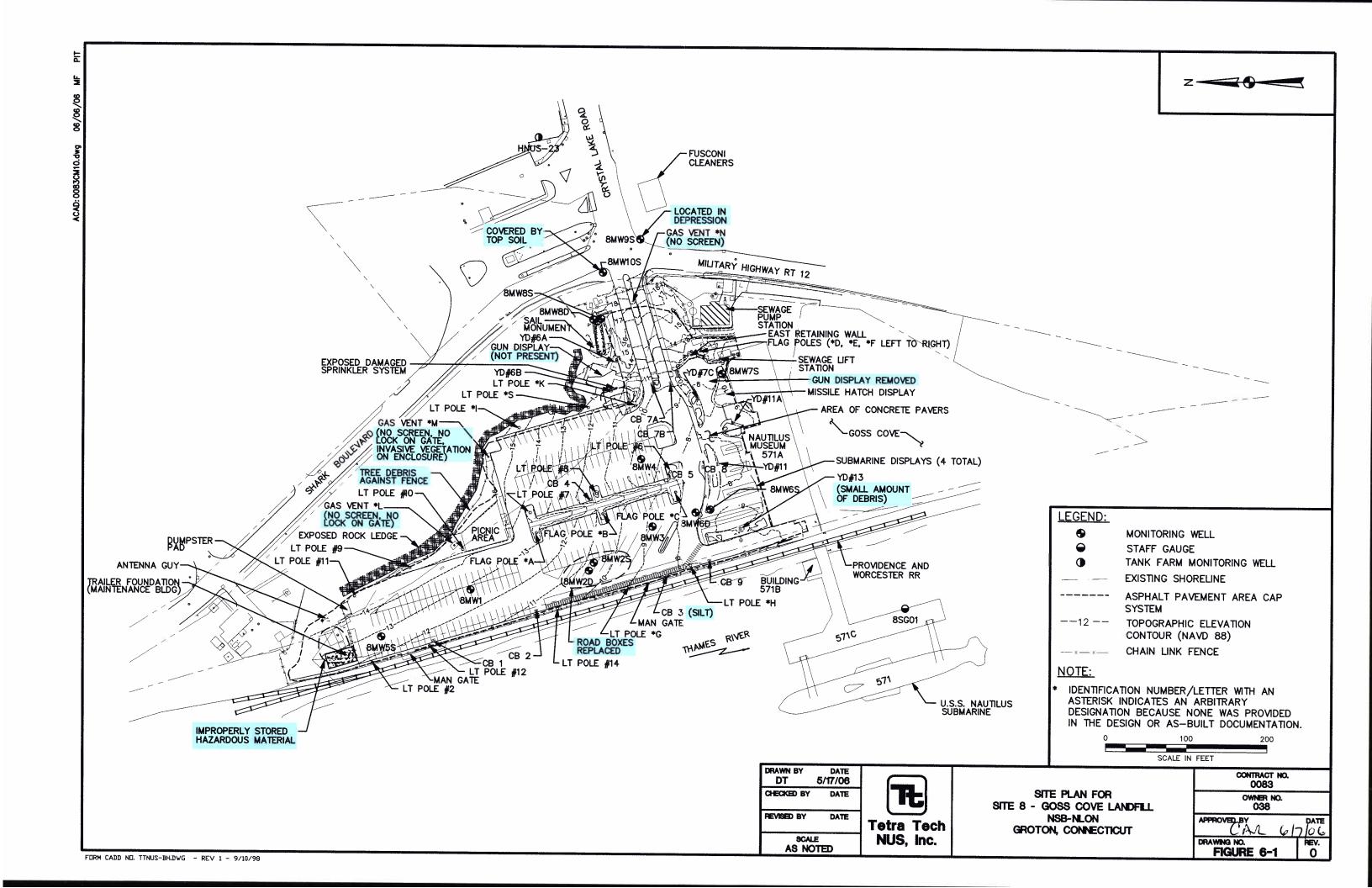
CTDEP - Connecticut Department of Environmental Protection.

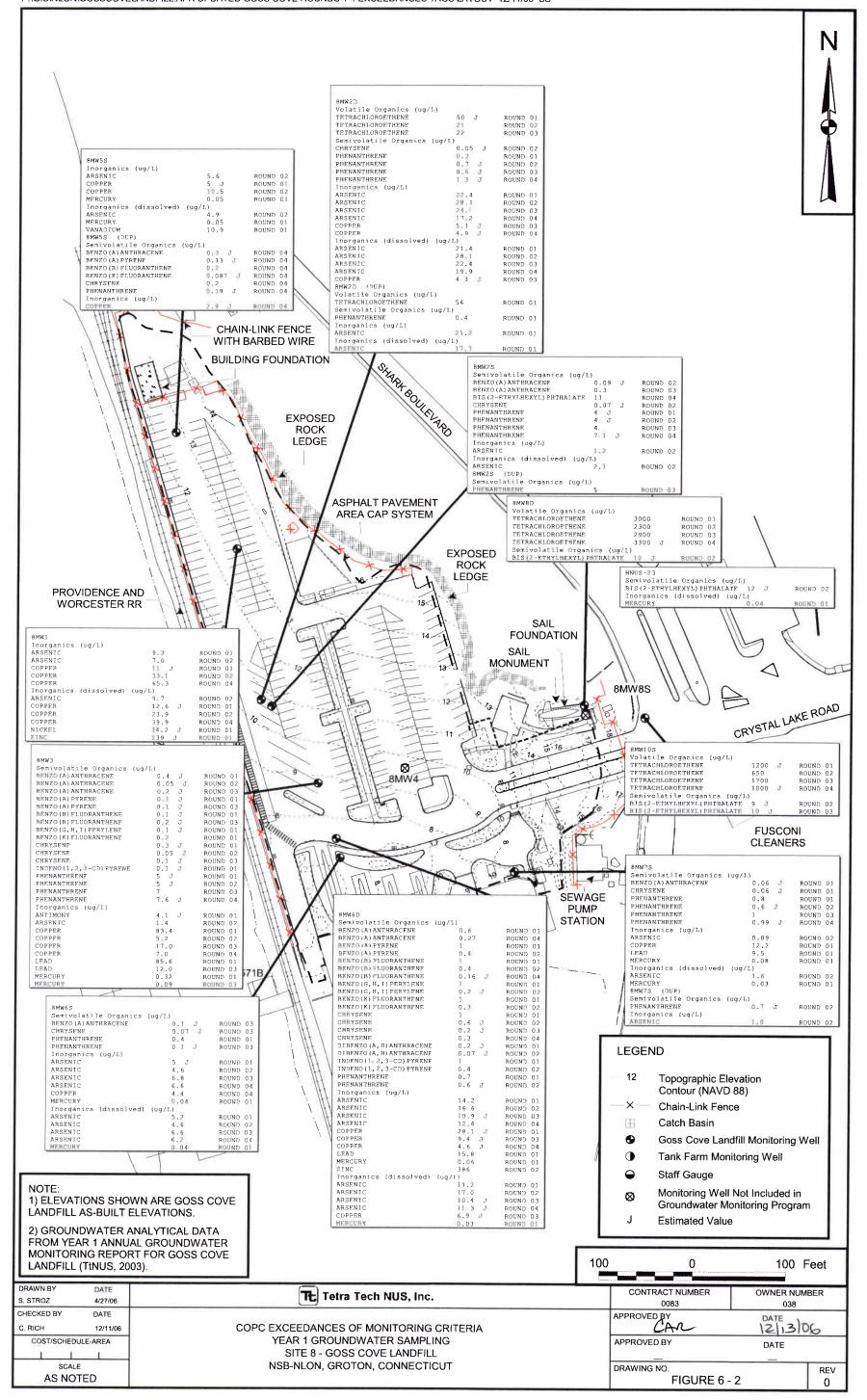
- 1 Connecticut Water Quality Standards (CTDEP, 1997, 2002)
- 2 Criterion for consumption of organisms only.
- 3 Criterion for saltwater at a chronic concentration.
- 4 Groundwater Monitoring Plan for Goss Cove Landfill (TtNUS, March 2001).
- 5 Operation and Maintenance Manual for Installation Restoration Program Sites (TtNUS, January 2006). Shading indicates that the criteria has changed.

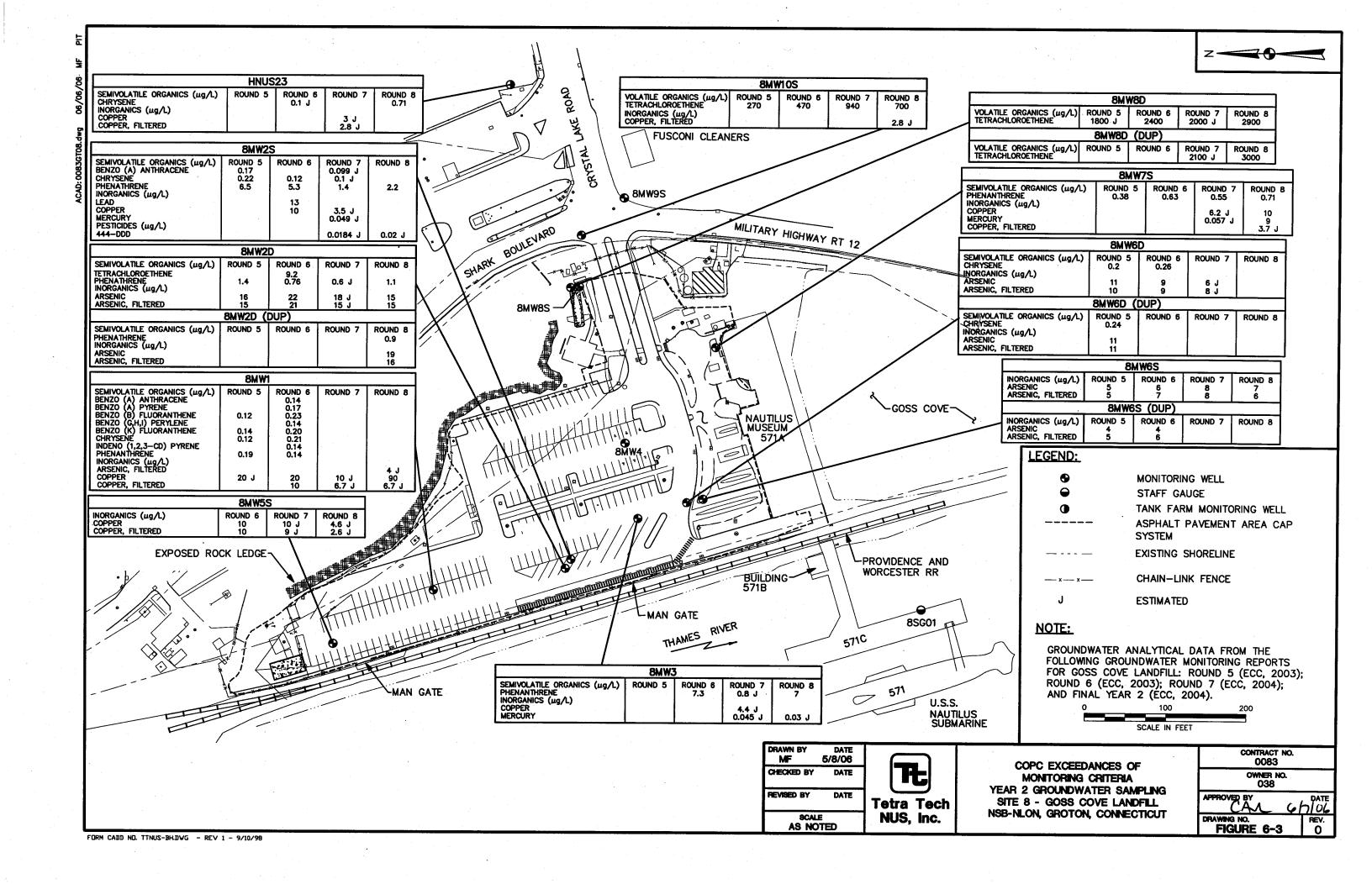
# **TABLE 6-6**

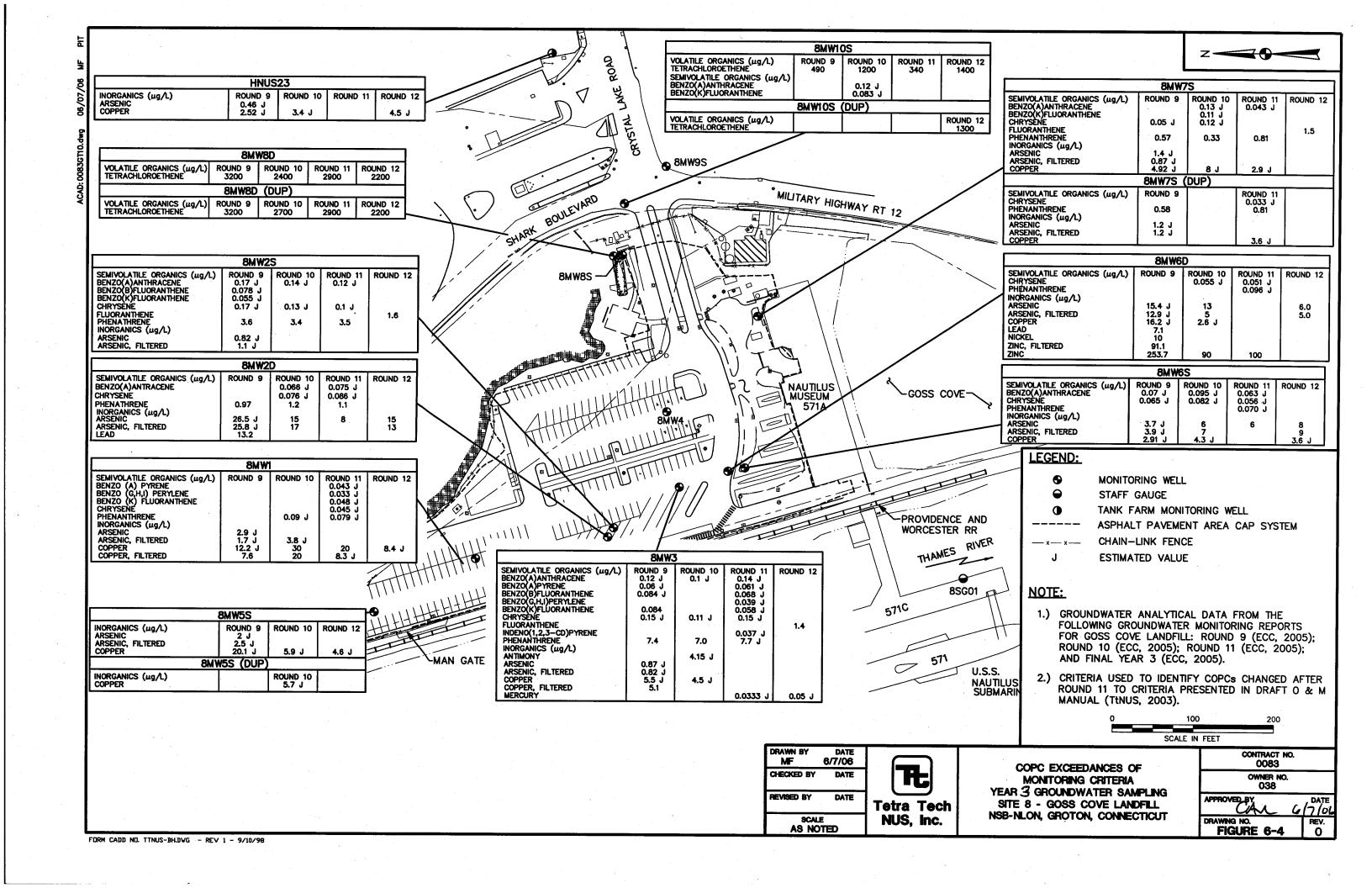
# SITE 8 DEFICIENCIES SITE 8 - GOSS COVE LANDFILL NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

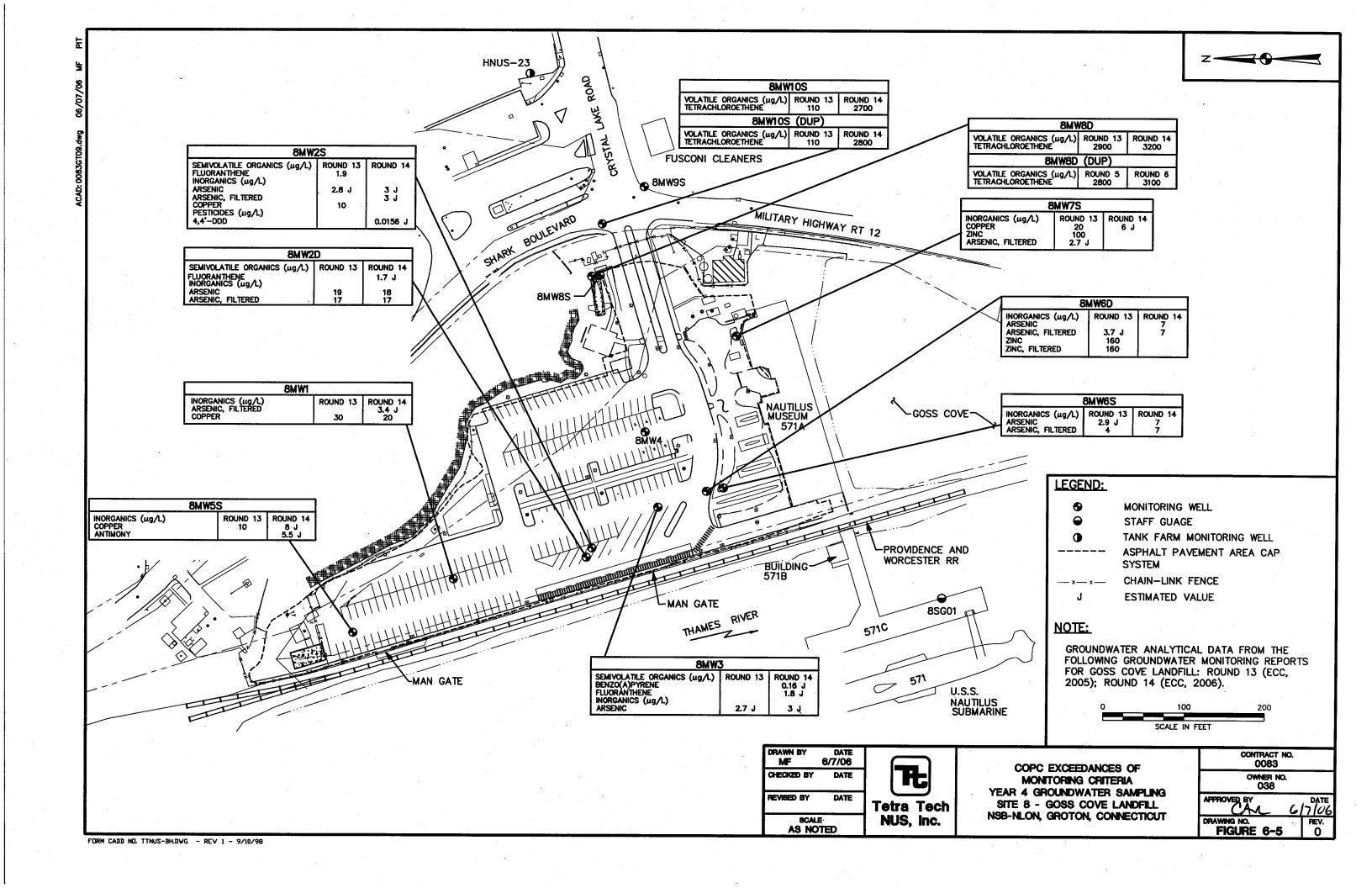
Deficiency	Effects Protectiveness	
	Current	Future
Gas vents require screens	N	N
Sprinkler system requires repair	N	Y
Maintenance of monitoring wells and dedicated sampling equipment	N	N
Abandonment of unused monitoring wells	N	N
Hazardous material not being properly stored in locked storage lockers	N	N
No Warning signs	N	Y











# 7.0 SITE 9 - OT-5

This five-year review is being conducted for Site 9 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure.

A removal action was conducted for the soil OU at Site 9, Waste OT-5, under RCRA, but a remedy for the groundwater OU has not yet been selected under CERCLA. The soil at Site 9 was investigated and remediated under the CTDEP RCRA UST Program; therefore, no decision documents were required or prepared for the soil OU. Groundwater associated with the site (OU9) is currently being investigated under CERCLA.

#### 7.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 9 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Crystal Lake drained and dredged to allow for construction of nine concrete USTs.	1940s
Waste OT-5 converted to storage tank for bilge water.	1970s
Use of OT-5 stopped and tank contents removed.	1993
Removal action and post-removal action sampling at OT-5.	1994
Post Removal Action Report for OT-5 completed.	1994
First Five-Year Review performed.	December 2001
BGOURI completed.	January 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

# 7.2 BACKGROUND

Site 9, Waste OT-5, was an underground, concrete storage tank located between Sculpin Avenue and Tang Avenue in the southern portion of NSB-NLON. The investigations at Site 9 were conducted under the CTDEP RCRA UST Program. The site map is included as Figure 7-1. The site's location relative to other IR sites is shown on Figure 1-2. The tank had a diameter of approximately 112 feet and was 11 feet deep. The top of the tank was approximately 5 feet below the ground surface and the tank had a capacity of approximately 750,000 gallons.

The tank was constructed in the 1940s and was used to store fuel oil. In the late 1970s, the tank was converted to a storage tank for bilge water and other waste solutions. Use of OT-5 was stopped in 1993, and all tank contents, including floating product and most of the settled sludge, were removed (HNUS, 1994a). A residual sludge layer of approximately 2 to 3 inches was left in the tank during purging. This sludge contained PCBs at concentrations exceeding 500 mg/kg (HNUS, 1994a).

After OT-5 was emptied, groundwater infiltrated through cracks in the concrete surface and partially refilled the tank (HNUS, 1994a). Subsurface contamination of the surrounding soil and groundwater may have been caused by draining of the infiltrated water through the cracks and into the surrounding media.

In 1993, a majority of the contents of OT-5, including the floating product layer, water, and sludge were removed and disposed off site. Residual materials contained in OT-5 were later removed and stored on site as follows:

Storage Vessel Contents

Frac Trailer No. 1 6,000 gallons of waste decontamination fluid

Frac Trailer No. 2 19,000 gallons of OT-5 bottom sludge

Roll-Off Container No. 1 20,000 pounds of bottom sludge, waste wipe cloths, and discarded

personal protective equipment (PPE)

Roll-Off Container No. 2 20,000 pounds of bottom sludge, waste wipe cloths, and discarded PPE

The primary waste contaminants were PCBs at concentrations in excess of 500 mg/kg.

In April 1994, B&RE completed a removal action of these materials and then performed post-removal action sampling that confirmed that residual waste materials had been properly shipped and disposed and that the waste storage vessels had been properly decontaminated (HNUS, 1994b). After the contents of OT-5 were removed, the tank was cleaned, and the top of the tank was crushed. The tank was closed in place by filling it with inert material.

Site 9 is located within the Tank Farm (Site 23). Further discussion of the investigation of the groundwater OU at Site 23 (OU9) under the CERCLA IRP is provided in Section 20.

# 7.3 REMEDIAL ACTIONS

#### 7.3.1 Remedy Selection

No RODs have been signed for OT-5. In April 1994, the Navy requested that HNUS complete the removal and disposal of the OT-5 waste still stored on site. The majority of the waste was an oily sludge removed from the bottom of OT-5. The main COCs in the OT-5 bottom sludge were PCBs with concentrations in excess of 500 mg/kg. Other wastes stored on site included spent decontamination fluids, waste diaper-like wipe cloths, and discarded PPE used during OT-5 closure activities. The objectives were to remove, ship, and dispose of all wastes, decontaminate the waste storage vessels, and conduct verification sampling and analysis.

# 7.3.2 Remedy Implementation

In 1994, HNUS completed a removal action at OT-5. The task included the removal and disposal of PCB-contaminated sludge at OT-5. Removal of OT-5 waste materials from the frac trailers and roll-off containers and off-site disposal of these waste materials were initiated by the RAC on July 21, 1994 and concluded on August 16, 1994. The waste stored inside the two frac trailers and the two roll-off containers was removed in accordance with the procedure described in the Removal Action Work Plan (HNUS, 1994b).

The liquid portion of the waste was aspirated from the frac trailers and roll-off containers into a PCB-dedicated vacuum trailer that was also used to ship the waste for off-site incineration and disposal at the Aptus facility located in Aragonite, Utah. A total of seven vacuum trailer loads were removed from the frac trailers and roll-off containers and shipped to Aptus.

The solid portion of the waste was consolidated into one of the two roll-off containers and shipped in that container for off-site incineration and disposal to the Aptus facility. The empty roll-off container was then returned to the site for decontamination.

Each waste load was weighed on site prior to departure and again upon arrival at the Aptus facility. A Uniform Hazardous Waste Manifest and Notification of Waste Subject to Land Disposal Restriction were prepared for each waste shipment.

Following waste removal, the inside surfaces of the frac trailers and roll-off containers were decontaminated, and wipe samples were collected for verification purposes from inside surfaces. The trailers and containers were decontaminated repeatedly until PCB concentrations from the wipe samples were less than the required 10 µg/100 cm<sup>2</sup>. The Post Removal Action Report (HNUS, 1994b) presents

the results of the verification sampling and analysis procedures performed by HNUS to verify that cleanup standards were met for the decontamination of the containers used for temporary on-site storage of the PCB-contaminated sludge removed from OT-5.

After the contents of OT-5 were removed, the tank was cleaned, and the top of the tank was crushed. The tank was closed in place by filling it with inert material. No further remedial action is necessary for soil to ensure protection of human health and the environment at Site 9. The removal action eliminated the need to conduct additional remedial action.

Groundwater associated with Site 9 is being addressed under Site 23. A ROD will be prepared to document the selected remedy for the groundwater OU (OU9).

#### 7.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 9. The recommendations from the First 5-Year Review report are provided below along with the actions that were taken to address the recommendations.

It was recommended that an NFA PRAP and ROD be completed for Site 9.

• A NFA Proposed Plan and ROD have not been prepared for the soil at Site 9.

It was recommended that the decision for the groundwater OU be addressed under Site 23 (Tank Farm).

• The Site 9 groundwater OU will be addressed under Site 23 (Tank Farm). A decision document for groundwater at Site 23 has not been prepared yet.

Also, it was recommended that there be enforcement of the IR Site Use Restriction Instruction.

• The instruction was updated to include the Goss Cove Landfill and re-issued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 9.

# 7.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

# 7.5.1 Document and Analytical Data Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 9. The results of the BGOURI are discussed in Section 20. Within the past 5 years, no other documents have been completed regarding this site.

# 7.5.2 ARAR and Site-Specific Action Level Changes

There have been no changes in ARARs that call into question the protectiveness of the remedy for soil. Groundwater at Site 9 is still being evaluated, and no decisions regarding the remediation of groundwater at this site have been determined.

# 7.5.3 Site Inspection

A site inspection conducted on April 4, 2006 included visual observations of the Site 23/Site 9 area. Weather conditions during the inspection were cold (mid-40s) and overcast with light precipitation. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. Appendix A contains one photograph taken of the Site 23/Site 9 (OT-5) area. During the inspection, representatives discussed the information required to close the site.

Site 9 is contained within Site 23, which is within a partially fenced area that is currently used for recreation. Groundwater at the Tank Farm is not used for human consumption, and it is not likely to be used for human consumption in the foreseeable future because of its current classification (i.e., GB groundwater classification indicates that it is not suitable for direct human consumption without treatment). There are no short-term or long-term plans to convert this area to any other use.

# 7.5.4 Site Interviews

No formal interviews were conducted for this site as part of the second five-year review because there were no active site issues to discuss.

#### 7.6 ASSESSMENT

The following conclusions support the determination that the remedy at Site 9 is protective of human health and the environment.

#### Question 1. Is the remedy functioning as intended by the decision documents?

- Remedial Action Performance: All contaminated wastes were removed from OT-5 (Site 9), and the tank has been properly closed in place. Groundwater at Site 9 is being evaluated under Site 23.
- System Operations/O&M: Not applicable.
- Opportunities for Optimization: Not applicable.
- Early Indicators of Potential Issues: No early indicators of potential remedy issues were noted during the review.
- Implementation of Institutional Controls and Other Measures: The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: The removal action conducted at Site 9 was completed in accordance with RCRA UST regulations. Decontamination was completed to specifications included in 40 CFR 761.125.
- Changes in Exposure Pathways: There have been no changes in exposure pathways.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in toxicity and other factors for COCs that would call into question the protectiveness of the remedy.
- Changes in Risk Assessment Methods: A risk assessment was not conducted for Site 9.
- Expected Progress Towards Meeting RAOs: RAOs for the groundwater at Site 9, a portion of OU9, will be defined in the future.

Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

# 7.7 ISSUES

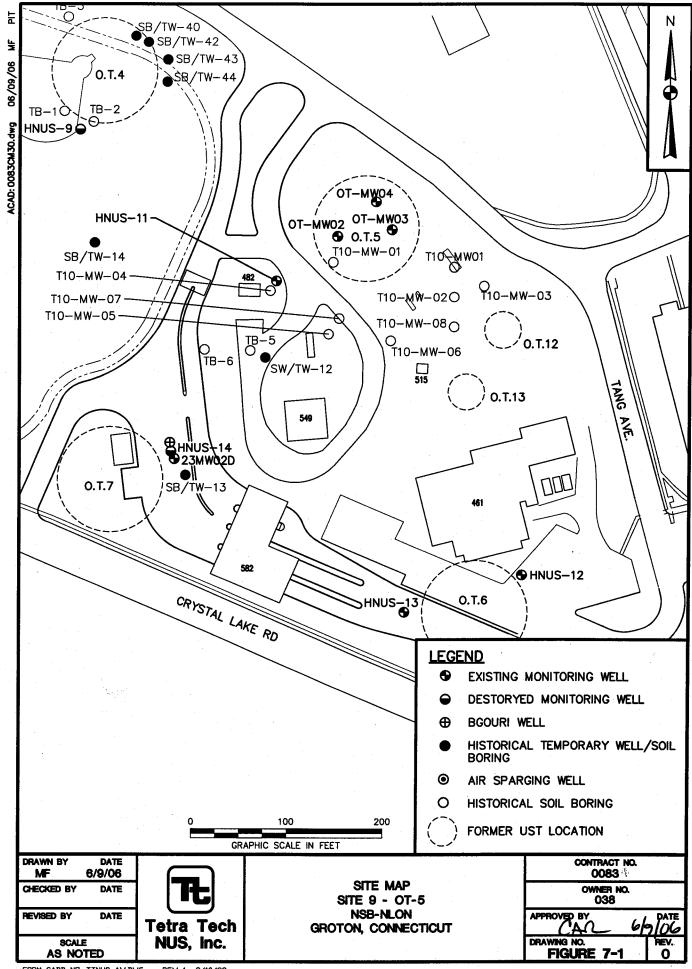
The only deficiency identified for Site 9 was that a ROD was not completed and signed for the soil OU.

# 7.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that an NFA Proposed Plan and ROD be completed for the Site 9 soil OU. It is recommended that the decision for the groundwater OU (OU9) be addressed under Site 23 (Tank Farm). Also, it is recommended that there be continued enforcement of the IR New London Instruction.

# 7.9 PROTECTIVENESS STATEMENT

The remedy for Site 9 is protective of human health and the environment. Current land use controls should minimize exposure to groundwater at the Tank Farm. In addition, the groundwater OU will be addressed in conjunction with Site 23.



# 8.0 SITE 10 – LOWER SUBASE - FUEL STORAGE TANKS AND TANK 54-H (OU 4)

This five-year review is being conducted for Site 10 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 10 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 8.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 10 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Five USTs put into service southwest of Building 107.	WW II
Tanks E, F, and G used to store diesel.	1942 – 1987
Tank K and L used to store lubrication and hydraulic oil.	1954-1989
Tank 54-H used as a reclamation tank for other five tanks.	NA
New steel tanks installed in locations of K and L.	After 1989
Phase I RI report completed.	1992
Phase II RI report completed.	1997
Final Lower Subase RI Report completed.	1999
First Five-Year Review Report completed.	December 2001
Draft Final FS for Soil and Groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18B updated.	December 2006

#### 8.2 BACKGROUND

Six former USTs, including Tank 54-H, were located at the Lower Subase at the corner of Corvina Road and Amber Jack Road. The site map is included as Figure 8-1. The location of Site 10 in relation to the other IR sites is shown on Figure 1-2.

Concrete USTs E, F, and G each had 125,000-gallon capacities and were used to store diesel fuel from 1942 to 1987. Concrete USTs K and L each had 25,000-gallon capacities and were used to store lubrication and hydraulic oil from 1954 to 1989. Tank 54-H had a 30,000-gallon capacity and was used as a reclamation tank for the other five tanks. Tanks E, F, and G have been decommissioned, and new

steel tanks have been installed within the concrete shells of Tanks K and L (USEPA, 1995a). Tank 54-H has also been decommissioned. The IAS concluded that there was some measurable leakage from the tanks at Site 10 and recommended monitoring of the tank levels to evaluate the leakage (Envirodyne, 1982).

In 1989, Fuss & O'Neill conducted a hydrogeologic investigation of two UST areas at NSB-NLON, one at the Tank Farm located southeast of the Lower Subase and the other in the Lower Subase (i.e., Site 10). The study was initiated as a result of subsurface soil contamination encountered during construction activities in the two areas. At Site 10, four monitoring wells (FOMW-13 through 16) were installed around Tank 54-H. Soil samples were collected from each well and field screened with an organic vapor analyzer (OVA). Groundwater samples from each of the monitoring wells were analyzed by a fixed-base laboratory for volatile aromatic hydrocarbons and scanned for petroleum products.

No. 2 fuel oil was detected in monitoring wells at Tank 54-H at concentrations ranging from 21 to 1,100 mg/L. In addition, low concentrations (less than 15 µg/L) of benzene and xylenes were detected in FOMW13. Fuss & O'Neill concluded that petroleum contamination had impacted groundwater in the area (Fuss & O'Neill, 1989).

Site 10 was included in the Phase II RI (B&RE, 1997a) and Lower Subase RI (TtNUS, 1999b). Sites 10 and 11 were evaluated collectively as Zone 1 in the Phase II RI and Lower Subase RI. Because of this approach, the remainder of this section discusses information in terms of Zone 1.

The Lower Subase RI Report (TtNUS, 1999b) recommended that Zone 1 proceed to an FS for evaluation of appropriate remedial alternatives for soil and limited actions for groundwater. Because of the extensive amount of underground utilities in Zone 1 and the nature of the activities conducted at this location (i.e., national security), the FS for this zone should evaluate, to the extent possible, passive and/or in-situ remedial alternatives and the use of institutional controls. In addition, "hot spot" removal actions, in lieu of full-scale excavation, should also be considered in the Zone 1 FS. It is also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 1, in conjunction with soil remedial alternatives. The scenarios evaluated for groundwater should include free-phase product removal from monitoring well 13MW18 and a monitored natural attenuation/tiered groundwater monitoring program. The scenario for the storm sewer system should include cleaning and repair of the system. These recommendations are based on the following information:

• The nature and extent of organic and inorganic contamination in soil are well defined to the extent practical considering infrastructure limitations.

- The baseline HHRA indicates that noncarcinogenic risks for the construction worker under the RME scenario slightly exceed 1.0. The assessment also shows that carcinogenic risks for the construction worker, full-time employee, and the hypothetical future resident under the RME scenario and for the hypothetical future resident under the Central Tendency Exposure (CTE) scenario are in excess of the CTDEP cumulative target risk level. In addition, carcinogenic risks for the full-time employee and hypothetical future resident under the RME scenario exceed the USEPA target risk range.
- Based on a comparison of analytical results with conservative, generic mobility criteria, organic and inorganic contamination in soil has the potential to migrate and impact groundwater at this site.
   Groundwater analytical data confirm these screening results and indicate that limited migration is currently occurring.
- Monitored natural attenuation or bioremediation could be feasible alternatives for the petroleum contamination in soil.
- Significant amounts of petroleum contamination remain in the soils of Zone 1; however, the historical source(s) of petroleum contamination have been eliminated (i.e., the leaking Site 10 and 11 USTs, the Building 89 UST, and the fuel distribution line have been removed and/or repaired). The Navy has implemented leak detection systems for all USTs and conducts regular pressure testing and repairs on fuel distribution lines.
- The zone is generally covered with pavement or buildings, which minimizes direct exposure to contaminated soil by human receptors.
- The groundwater at Zone 1 is not currently or anticipated to be used in the future as a potable water source because it is brackish; therefore, there is no imminent threat to human health.
- The ERA for the Thames River adjacent to Zone 1 and the baseline HHRA for Zone 2 (both downgradient receptors of Zone 1) show that the risks to ecological and human receptors in these adjacent areas are currently minor. In addition, the Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 1.
- Free-phase petroleum product was only detected in well 13MW18 during the latest round of sampling.
- Key parameters indicate that natural attenuation processes are at work in the groundwater of Zone 1, and these processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Monitored natural attenuation should

be further evaluated as part of the remedial strategy for Zone 1 to confirm the effectiveness of these processes. The monitored natural attenuation program should include or be part of a tiered groundwater monitoring program, similar to those currently being implemented at other NSB-NLON IRP sites. Tiered programs confirm or disprove that contamination present in soil is mobile and impacting other media and allow for further actions to be completed if results show significant impacts.

• The storm sewer system in Zone 1 is a potential migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two Zone 1 catch basins were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested, and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

An FS is currently being prepared for Zone 1 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 1 will be selected after the FS is finalized.

#### 8.3 REMEDIAL ACTIONS

#### 8.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 1, which includes Site 10. An FS is currently being prepared to evaluate remedial alternatives for the zone. The Lower Subase RI recommended that the FS for Zone 1 evaluate, to the extent possible, passive and/or in-situ remedial alternatives and the use of institutional controls. In addition, hot spot removal actions should also be considered in the FS for Zone 1. The RI also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 1 in conjunction with soil remedial alternatives.

# 8.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 1. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 1 will be selected after the FS is finalized.

#### 8.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 10. The recommendations from the First 5-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 1 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

It was also recommended that there be enforcement of the IR Site Use Restriction Instruction (Navy, 2000b).

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 10.

# 8.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

# 8.5.1 <u>Document Review</u>

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 10. Within the past 5 years, no other documents have been completed regarding this site.

# 8.5.2 <u>Data Review</u>

No new data was collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

#### 8.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 1; therefore, ARARs and sitespecific action levels have not been identified for Zone 1.

# 8.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 1 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON and to avoid security issues the team conducted a drive through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, EPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. No issues were identified and no photos of the zone were taken during the inspection. The Navy has no plans to change the current use of the site.

#### 8.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

#### 8.6 ASSESSMENT

Because a final remedy has not been selected for Zone 1, conclusions cannot be made at this time to support the determination that the remedy for Zone 1 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment.

The Navy has an IR Site Use Restriction instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

#### 8.7 ISSUES

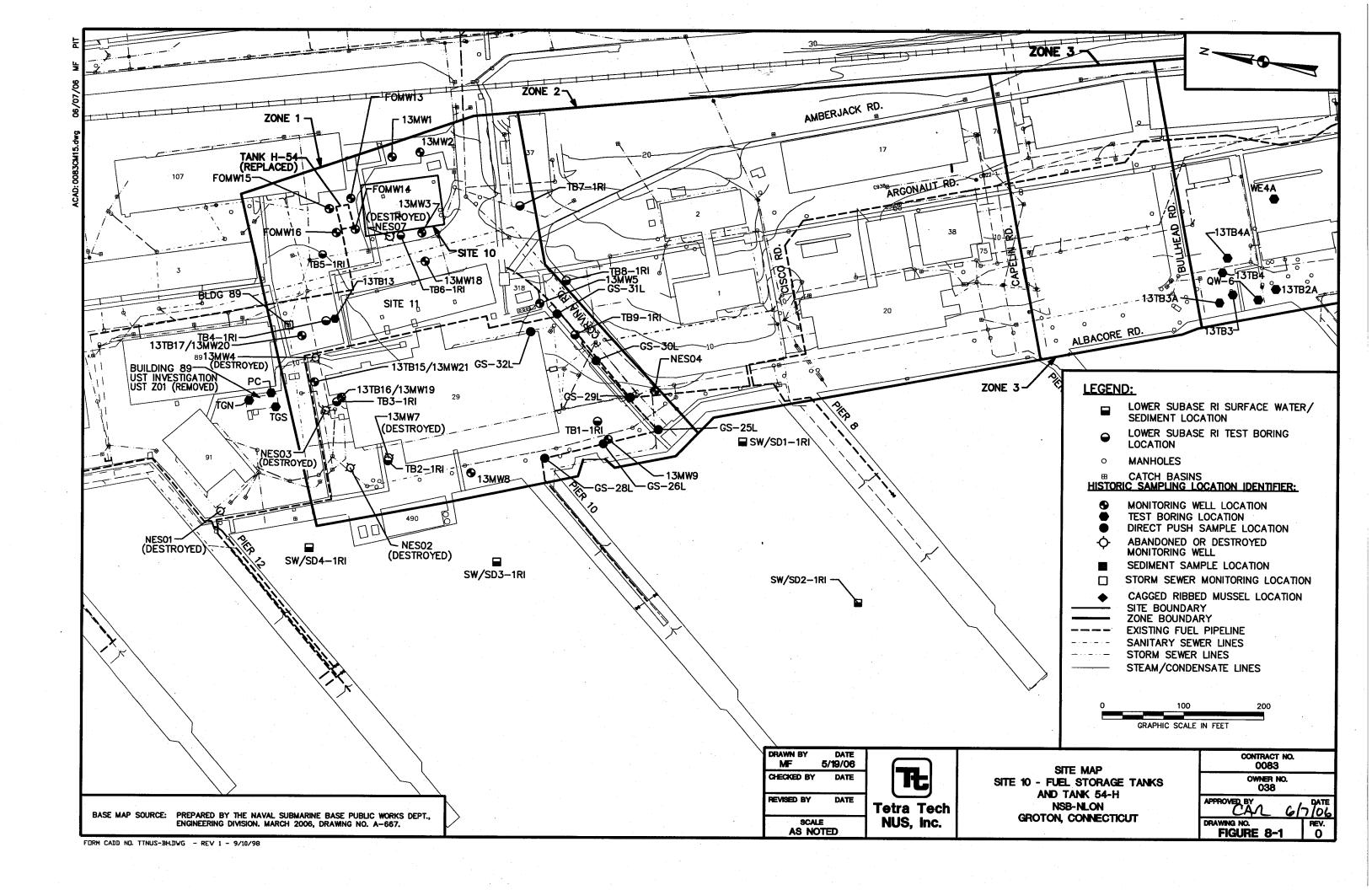
A final remedy has not been selected for Zone 1; therefore, deficiencies cannot be determined at this time.

#### 8.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine an appropriate remedial action for Zone 1 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be continued enforcement of the IR New London Instruction.

# 8.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 1, which includes Site 10, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts site activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



# 9.0 SITE 11 - LOWER SUBASE - POWER PLANT OIL TANKS (OU4)

This five-year review is being conducted for Site 11 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 11 is currently being investigation under CERCLA. No decision documents have been prepared for this site.

#### 9.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 11 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Four USTs in place.	WW II
IAS detected leakage from tanks and recommended replacement of the tanks.	1982
Tanks A and B used to store No. 6 fuel oil.	WW II - 1980s
Tank C used to store diesel oil.	WW II – mid-1980s
Tank D used to store waste oil.	WW II – mid-1980s
Three new USTs installed.	mid-1980s
Final Site Investigation recommended further review of the operation and distribution of oil in Building 29.	1987
Phase I RI Report completed.	1992
Phase II RI Report completed.	1997
Final Lower Subase RI Report completed.	1999
First Five-Year Review performed	December 2001
Draft Final FS for Soil and Groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

#### 9.2 BACKGROUND

Site 11 consists of four former USTs (A, B, C, and D) located immediately east of Building 29. The site map is included as Figure 9-1. The location of Site 11 in relation to the other IR sites is shown on Figure 1-2. Concrete tanks A and B each had a capacity of 170,000 gallons and were used to store No. 6 grade fuel oil that was pumped from the Tank Farm located at the southern end of NSB-NLON. Concrete tanks C and D each had a capacity of 170,000 gallons. Tank C was used to store diesel oil, and Tank D was

used to store waste oil generated by the bilge water oil recovery system at the power plant. The tanks were installed during World War II and were decommissioned in the mid-1980s. The old concrete tanks were repaired and are now used as containment structures for three new, 150,000-gallon steel tanks.

According to the IAS, there was leakage from the tanks, and petroleum had migrated to groundwater, the steam and fuel pipeline tunnels, and the underground vaults. The IAS recommended replacing the tanks at Site 11 and implementing oil recovery (Envirodyne, 1982).

In 1987, Wehran Engineering Corporation completed a Final Site Investigation for subsurface oil contamination and identified an area within Site 11 that was contaminated with heavy oil. This area, comprising of electrical conduits and manholes along Corvina Road, contained a mixture of No. 5 and No. 6 fuel oils. Wehran recommended that further review of the operation and distribution of oil in Building 29 be conducted (Wehran, 1987).

This site was included in the Phase II RI (B&RE, 1997a) and Lower Subase RI (TtNUS, 1999b). Sites 10 and 11 were evaluated collectively as Zone 1 in the Phase II RI and Lower Subase RI. Because of this approach, the remainder of this section discusses information in terms of Zone 1.

The Lower Subase RI recommended that Zone 1 proceed to an FS for evaluation of appropriate remedial alternatives for soil and limited actions for groundwater. Because of the extensive amount of underground utilities in Zone 1 and the nature of the activities conducted at this location (i.e., national security), the FS for this zone should evaluate, to the extent possible, passive and/or in-situ remedial alternatives and the use of institutional controls. In addition, "hot spot" removal actions, in lieu of full-scale excavation, should also be considered in the Zone 1 FS. It is also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 1, in conjunction with soil remedial alternatives. The scenarios evaluated for groundwater should include free-phase product removal from monitoring well 13MW18 and a monitored natural attenuation/tiered groundwater monitoring program. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in soil are well defined to the extent practical considering infrastructure limitations.
- The baseline HHRA indicates that noncarcinogenic risks for the construction worker under the RME scenario slightly exceed 1.0. The assessment also shows that carcinogenic risks for the construction worker, full-time employee, and the hypothetical future resident under the RME scenario and for the hypothetical future resident under the CTE scenario are in excess of the CTDEP cumulative target

risk level. In addition, carcinogenic risks for the full-time employee and hypothetical future resident under the RME scenario exceed the USEPA target risk range.

- Based on a comparison of analytical results with conservative, generic mobility criteria, organic and inorganic contamination in soil has the potential to migrate and impact groundwater at this site.
   Groundwater analytical data confirm these screening results and indicate that limited migration is currently occurring.
- Monitored natural attenuation or bioremediation could be feasible alternatives for the petroleum contamination in soil.
- Significant amounts of petroleum contamination remain in the soils of Zone 1; however, the historical source(s) of petroleum contamination have been eliminated (i.e., the leaking Site 10 and 11 USTs, the Building 89 UST, and the fuel distribution line have been removed and/or repaired). The Navy has implemented leak detection systems for all USTs and conducts regular pressure testing and repairs on fuel distribution lines.
- The zone is generally covered with pavement or buildings, which minimizes direct exposure to contaminated soil by human receptors.
- The groundwater at Zone 1 is not currently or anticipated to be used in the future as a potable water source because it is brackish; therefore, there is no imminent threat to human health.
- The ERA for the Thames River adjacent to Zone 1 and the baseline HHRA for Zone 2 (both downgradient receptors of Zone 1) show that the risks to ecological and human receptors in these adjacent areas are currently minor. In addition, the Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 1.
- Free-phase petroleum product was only detected in well 13MW18 during the latest round of sampling.
- Key parameters indicate that natural attenuation processes are at work in the groundwater of Zone 1, and these processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Monitored natural attenuation should be further evaluated as part of the remedial strategy for Zone 1 to confirm the effectiveness of these processes. The monitored natural attenuation program should include or be part of a tiered groundwater monitoring program, similar to those currently being implemented at other NSB-NLON IRP sites. Tiered programs confirm or disprove that contamination present in soil is mobile and

impacting other media and allow for further actions to be completed if results show significant impacts.

• The storm sewer system in Zone 1 is a potential migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two Zone 1 catch basins were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed offsite. The storm sewer lines were not surveyed or repaired during the effort.

An FS is currently being prepared for Zone 1 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 1 will be selected after the FS is finalized.

#### 9.3 REMEDIAL ACTIONS

#### 9.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 1, which includes Site 11. An FS is currently being prepared to further evaluate remedial alternatives for the zone. The Lower Subase RI recommended that the FS for Zone 1 evaluate, to the extent possible, passive and/or in-situ remedial alternatives and the use of institutional controls. In addition, hot spot removal actions should also be considered in the FS for Zone 1. The RI also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 1, in conjunction with soil remedial alternatives.

# 9.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 1. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 1 will be selected after the FS is finalized.

# 9.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 11. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 1 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction Instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 11.

#### 9.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 9.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 11. Within the past 5 years, no other documents have been completed regarding this site.

# 9.5.2 <u>Data Review</u>

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

# 9.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 1; therefore, ARARs and sitespecific actional levels have not been identified for Zone 1.

# 9.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 1 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. No issues were identified and no photos of the zone were taken during the inspection. The Navy has no plans to change the current use of the site.

#### 9.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second five-year review.

#### 9.6 ASSESSMENT

Because a final remedy has not been selected for Zone 1, conclusions cannot be made to support the determination that the remedy for Zone 1 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health and the environment.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.

#### 9.7 ISSUES

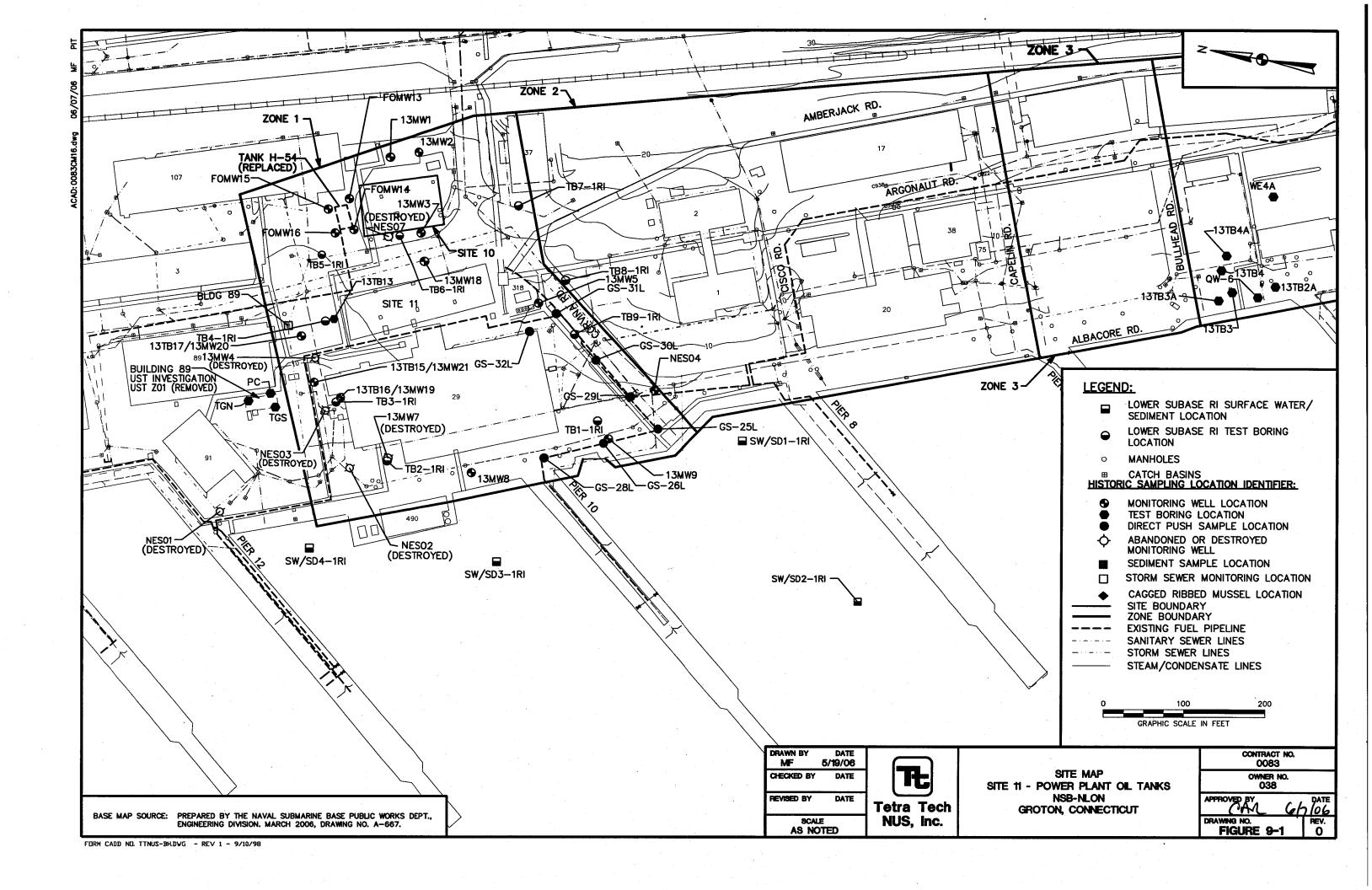
A final remedy has not been selected for Zone 1; therefore, deficiencies cannot be determined at this time.

# 9.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 1 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be enforcement of the IR New London Instruction.

# 9.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 1, which includes Site 11, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of the development of the FS.



# 10.0 SITE 13 - LOWER SUBASE - BUILDING 79 WASTE OIL PIT (OU4)

This five-year review is being conducted for Site 13 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 13 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 10.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 13 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Oil detected in soil samples from waste oil pit location.	1979
Waste oil pit filled and a recovery well system installed and operated for several months.	1985
Phase I RI completed.	1992
Quay Wall removal action completed.	1994
Phase II RI completed.	1997
Final Lower Subase RI completed.	1999
First Five-Year Review performed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

#### 10.2 BACKGROUND

Site 13 consists of the former waste oil pit located in the northwestern corner of Building 79 on the Lower Subase. The site map is included as Figure 10-1. Figure 1-2 shows the location of the site relevant to the other IR sites at NSB-NLON. The pit was formerly used as a collection area for waste oil and solvents generated during the cleaning and servicing of diesel train engines. The pit has been filled with concrete (Wehran, 1987), and a recovery well system was installed in approximately 1985. The system operated for a period of several months but was determined to be ineffective and was later abandoned.

Analytical results from soil samples collected from borings in the area of the waste oil pit indicate that subsurface contamination is primarily lubricating/motor oil (NESO, 1979). The oil was detected at a

sample interval of 6 to 9 feet below ground surface. It is estimated that the saturated volume of contamination is approximately 50 feet by 50 feet by 4 feet deep.

In 1987, Wehran Engineering Corporation completed an investigation to identify and delineate the sources of heavy oils in the subsurface of the Lower Subase (Sites 10, 11, and 13). Manholes and the area underneath the supporting platform in the vicinity of Building 79 (Site 13) contained No. 6 fuel oil older than 1 year and trace levels of waste oils. Wehran recommended removal of the oil from the manholes near Building 79 using absorption pads and/or excavation of oil-laden soil and inspection of fuel lines within the trench and subsequent cleaning of the trench.

During the Phase I RI, a brown milky oil was identified west of Building 79. The report indicated that this oil potentially originated from the former waste pit in Building 79. An old drawing showed the outlet from the waste oil pit 29 feet south of the northern side of Building 79 (Atlantic, 1992).

The Quay Wall Study Area runs from approximately Pier 2 to Pier 6 (see Figure 10-1). An investigation and removal action were completed in this area to address petroleum contamination. The area was manmade and consists of a wooden platform and quay wall that were constructed in 1940. The wooden platform is 4 inches thick and is supported by 10- to 12-inch-square wooden joists and 8-inch timber pilings. A steel bulkhead along the Thames River was erected in 1952; it was constructed of steel sheet piling and supports. During construction of the bulkhead, the quay wall and wooden platform were covered with approximately 6 to 7 feet of sand and gravel fill, and the area was paved for vehicular access along Albacore Road. The quay wall is located approximately 4 feet east of the steel bulkhead, immediately beneath the paved surface. Fill soil below the wooden platform and quay wall periodically wash out, leaving void spaces of 3 to 8 feet beneath the wooden platform. Sand and gravel fill separate the void spaces and the void spaces, are replaced with sand poured into a series of manholes along the length of Albacore Road. Natural river deposits of silt and sand underlie the void spaces and sand fill.

Zones of visible petroleum contamination were present in the soil immediately above the wooden platform and in the fill below the wooden platform. Petroleum was found in the area around the storm sewer manhole northeast of Pier 4. Globules of floating product were also present in standing water in the void spaces below the wooden platform. Releases of petroleum products and oily substances were observed in the Thames River in the vicinity of the storm sewer outfall just north of Pier 4 in November 1994. It was determined that the probable source of the releases was the storm sewer manhole near Pier 4 and Building 79. An expandable rubber plug was placed in the storm sewer outfall in November 1994, and the storm sewer pipe leading to the outfall was filled with sand in late December 1994. This measure appears to have eliminated migration of petroleum product from this outlet because no visible release of petroleum product has subsequently been observed in the Thames River near the outlet.

HNUS prepared a Removal Site Evaluation for the quay wall to summarize the removal actions performed in November and December 1994 to address petroleum product releases that occurred along the quay wall of the Lower Subase. A summary of the actions completed is as follows:

- From November 4 to 6, 1994, a spill response and cleanup contractor retained by the Navy completed cleanup activities.
- Approximately 2,300 gallons of oily waste water and thirty-nine 55-gallon drums, two 30-gallon drums, and one 18-gallon drum of absorbent pads contaminated with product were generated during cleanup activities.
- Five product recovery wells (QW-1 through QW-5) were subsequently installed. Oil/water was pumped from the recovery wells four times between December 5 and 21, 1994. A total of approximately 16,000 gallons of oil/water was pumped and containerized. A small percentage of the liquid pumped (less than 5 percent) was petroleum product.

One subsurface soil sample was collected from five of the six borings. Four of the soil samples (QW-2, QW-3, QW-4, and QW-5) were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and TPH. The fifth soil sample (QW-1) was analyzed for TCL organics, TAL inorganics plus boron, TPH, and TCLP metals. Lead was identified as the only chemical of concern. Based on current and anticipated land use of the area, direct exposures to lead were not considered likely except during construction activities. Therefore, the Removal Site Evaluation recommended that no further removal action be performed at that time but that further site investigations focus on lead concentrations. It was estimated that no more than 800 gallons of petroleum were pumped from the void spaces.

A majority of the site is paved or covered with buildings. This site was included in Zone 4 of the Phase II RI and the Lower Subase RI. Because of this approach, the remainder of this section discusses information in terms of Zone 4.

The Lower Subase RI recommended that Zone 4, which includes Site 13 - Building 79 Waste Oil Pit, Site 19 - Solvent Storage Area (Building 316), the Quay Wall Study Area, and the fuel distribution pipeline, proceed to an FS to evaluate appropriate remedial alternatives. Because of the extensive amount of underground utilities in Zone 4 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus, to the extent possible, on evaluation of alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives. In addition, the Zone 4 FS should consider "hot spot" removal actions in lieu

of full-scale excavation. A tiered groundwater monitoring program and cleaning and repair of the Zone 4 storm sewer system should also be evaluated during the FS. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in the soil and groundwater are well
  defined to the extent practical considering infrastructure limitations.
- The baseline HHRA indicates that carcinogenic risks associated with Zone 4 exceed the USEPA acceptable risk range (i.e., the hypothetical future resident RME scenario) and CTDEP target risk level (i.e., the full-time employee and hypothetical future resident RME scenarios). In addition, modeling performed to evaluate exposures to lead showed that receptors sensitive to lead exposure (i.e., small children and fetuses of pregnant working women) are at risk in Zone 4. All the elevated risks (for lead and other chemicals) were calculated for a future exposure scenario where soils currently covered by pavement or buildings would be available for human contact. Institutional controls and/or hot spot removal actions could be used to eliminate this exposure route.
- Evidence suggests that limited organic and inorganic contamination is migrating from the site.
   Natural attenuation seems to be occurring in the groundwater of Zone 4 and is most likely reducing the concentrations of petroleum hydrocarbons migrating from the site. Groundwater monitoring will confirm natural attenuation and potential inorganic migration.
- Natural attenuation or bioremediation could be feasible alternatives to address petroleum contamination in soil.
- A tiered groundwater monitoring program would allow for further actions to be implemented if results show significant impacts.
- The ERA for the Thames River adjacent to Zone 4 showed that the risks to ecological receptors in this area are relatively low to moderate. Maximum concentrations of several non-AVS inorganics in Zone 4 sediments near the Lower Subase exceeded conservative guidelines (e.g., ER-Ls) indicating that potential risks may be present. The AVS/SEM analysis suggested that cadmium, copper, nickel, lead, and zinc are not bioavailable. Beryllium, boron, cobalt, thallium, and vanadium were retained as COCs because conservative sediment guidelines were unavailable. No alternate guideline was available for barium, the maximum concentration of which exceeded the conservative guideline. The COCs were concluded to not be of ecological significance in the NSB-NLON Phase II RI ERA for the Thames River. Benzo(a)pyrene was the only organic in Zone 4 sediments that had maximum concentrations in excess of guidelines. The average concentration of benzo(a)pyrene also exceeded

the guideline. The maximum concentration slightly exceeded its ER-M. Despite exceedances of guideline values by several COCs, no significant toxicity was observed in Zone 4 sediment toxicity tests from the NSB-NLON Phase II RI. Low concentrations of some PAHs were detected in a native blue mussel sample collected in Zone 4 as part of the NSB-NLON Phase II RI ERA. Chromium, mercury, and benzo(a)pyrene were not detected in that sample, indicating that they were probably not bioavailable. Boron was detected in the blue mussel sample from Zone 4 and in the blue mussel sample collected south of Zone 4 at concentrations greatly exceeding background and control concentrations. The toxicological significant is unclear due a lack to toxicity data for that metal. The NSB-NLON Phase II RI concluded that boron was not of ecological significance in the Thames River. The weight of evidence appears to indicate that potential risks to sediment-dwelling organisms from contaminants in Zone 4 sediment are present and that these potential risks are low to moderate.

- The Thames River provides significant dilution and mixing, which minimize the impact of contaminant migration from Zone 4.
- The Navy removed the waste oil pit at Building 79 and filled the area with concrete. A recovery well system was installed and operated for a short time in this area. In addition, approximately 800 gallons of petroleum product were removed via pumping from the quay wall area during a removal action in 1994.
- The Navy currently conducts regular pressure testing and repairs on the fuel distribution lines;
   therefore, the historical source of petroleum contamination has most likely been minimized.
- Zone 4 is covered with pavement or buildings, which minimizes the potential for direct exposure to contaminated soil by human receptors.
- The groundwater at Zone 4 is not currently or anticipated to be used in the future as a potable water source because it is brackish and classified as GB; therefore, there is no imminent threat to human health.
- The storm sewer system in Zone 4 is a potential migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Seven Zone 4 catch basins were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

An FS is currently being prepared for Zone 4 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 4 will be selected after the FS is finalized.

### 10.3 REMEDIAL ACTIONS

### 10.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 4, which includes Site 13. An FS is currently being prepared to evaluate alternatives for the zone. The Lower Subase RI recommended that the FS for Zone 4 evaluate a range of remedial alternatives that include institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives.

### 10.3.2 <u>Remedy Implementation</u>

A final remedy has not yet been chosen for Zone 4. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

### 10.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 13. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 4 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction Instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 13.

### 10.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 10.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 13. Within the past 5 years, no other documents have been completed regarding this site.

### 10.5.2 <u>Data Review</u>

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

# 10.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 4; therefore, ARARs and sitespecific action levels have not been identified for Zone 4.

# 10.5.4 <u>Site Inspection</u>

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 4 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. No issues were identified and no photos of the zone were taken during the inspection. The Navy has no plans to change the current use of the site.

### 10.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

### 10.6 ASSESSMENT

Because a final remedy has not been selected for Zone 4, conclusions cannot be made to support the determination that the remedy for Zone 4 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils or any subsurface disturbance of soils and/or groundwater at IR sites.

### 10.7 ISSUES

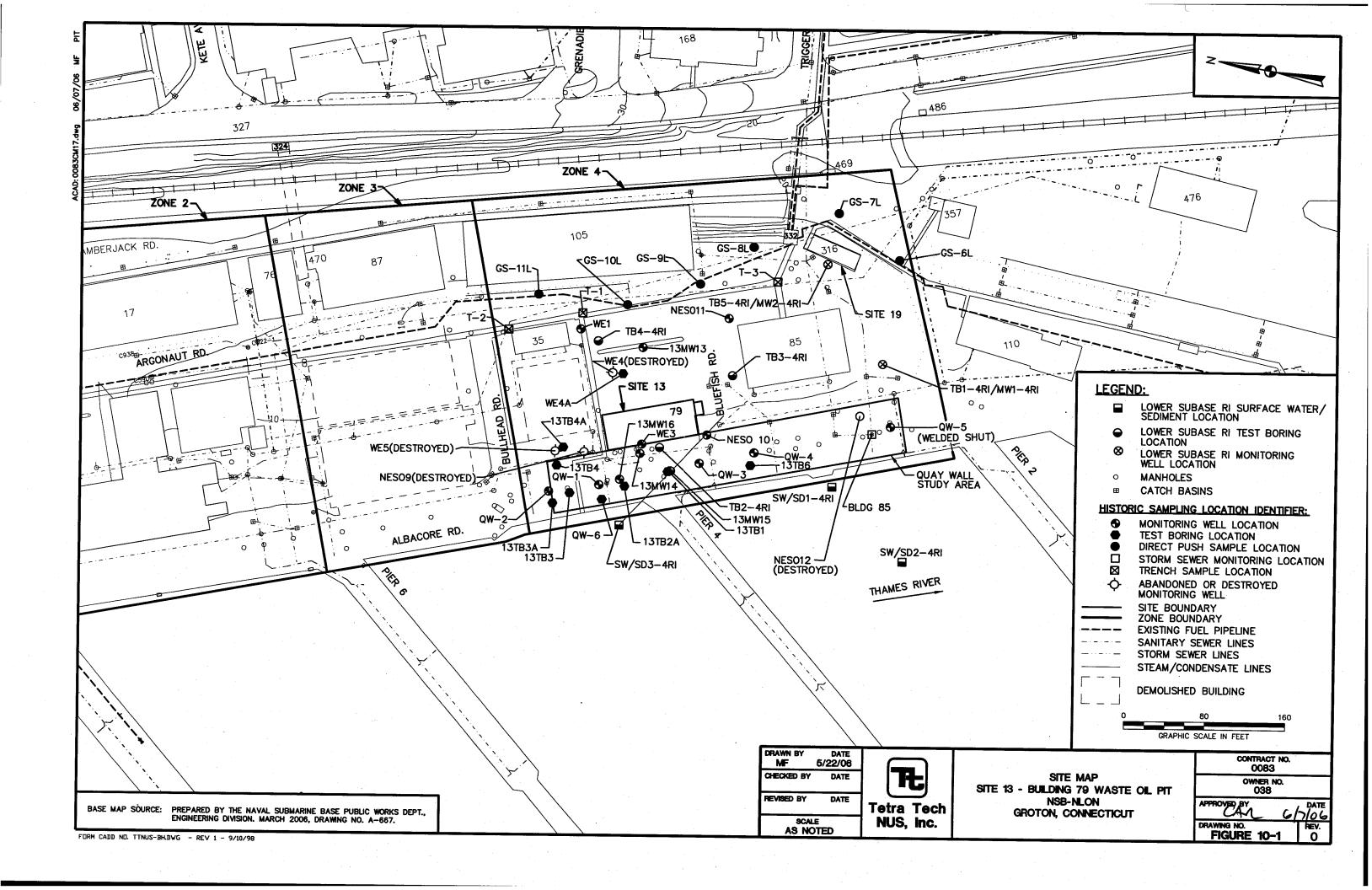
A final remedy has not yet been implemented for Zone 4, therefore deficiencies cannot be determined at this time.

### 10.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 4 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be enforcement of the IR Site Use Restriction Instruction.

### 10.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 4, which includes Site 13, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



# 11.0 SITE 14 – OVERBANK DISPOSAL AREA NORTHEAST (OBDANE) (OU8 AND OU9)

This five-year review is being conducted for Site 14 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. An Action Memorandum and NTCRA for soil and waste were completed. The removal action resulted in no hazardous substances remaining in soil at the site that would limit use or restrict exposure. A NFA ROD was subsequently signed for the soil OU (OU8) in 2004 (Navy, 2004f). Evaluations showed that exposure to Site 14 groundwater would not result in any unacceptable risks to human health or the environment, and an NFA remedy was selected for the groundwater OU, a portion of OU9, in an Interim ROD (Navy, 2004b). It is expected that NFA will be the final remedy for Site 14 groundwater after remedial actions are selected for all portions of OU9.

### 11.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 14 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Miscellaneous wastes dumped over the bedrock edge.	Prior to 1972
Final IAS completed.	1983
Phase I RI completed.	1992
Phase II RI completed.	1997
OBDANE EE/CA and Action Memorandum completed.	1999
NTCRA completed.	May 2001
First Five-Year Review completed.	December 2001
BGOURI completed.	January 2002
Final Removal Action Report completed.	February 2002
BGOURI Update/FS completed.	July 2004
Proposed Plan for Site 7 Torpedo Shops and Site 14 OBDANE Soil (OU8) completed.	July 2004
ROD for Site 7 - Torpedo Shops and Site 14 - OBDANE Soil (OU8) completed.	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) completed.	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater completed.	December 2004

### 11.2 BACKGROUND

The OBDANE site is located in a heavily wooded area on the edge of a ravine north of Stream 3 of the Area A Downstream Watercourses, west of the Area A Weapons Center, and south of the Torpedo Shops. Prior to 1972, miscellaneous wastes were apparently dumped over the bedrock edge in circular area approximately 80 feet in diameter. A dirt road provided limited access to the wooded site. Figure 11-1 shows the general site arrangement. The location of Site 14 in relation to the other IR sites is shown on Figure 1-2. A nearly vertical 20-foot-high bedrock face is located at the eastern edge of the site. The rest of the site slopes to the southwest.

The IAS Report (Envirodyne, 1983) stated that vegetation at the site indicated that no dumping had occurred within 10 years prior to the 1982 investigation. The IAS Report documented the presence of several empty fiber drums. Atlantic personnel inspected the site on September 30, 1988 and verified that the drums were still present. No visual staining or stressed vegetation was observed at this time. No development of this area was planned.

During the Phase I RI, surface soil samples were collected from within the limits of the identified disposal area. Based on the sample results, the RI concluded that there was negligible risk associated with Site 14 and recommended that a supplemental Step I Investigation be performed. During the Phase II RI investigation, a single shallow monitoring well was installed downgradient of the site and two rounds of groundwater samples were collected. Six additional soil samples were also collected within the limits of the disposal area and downgradient of the area. The Phase II RI concluded that all human health risks were found to be within or less than USEPA's target range; however, arsenic was found in surface soil samples at concentrations slightly exceeding State standards, and lead contamination was found in surface soil samples approximately 80 feet south of the site. The RI Report recommended that further characterization of surface soil with respect to arsenic and lead be completed.

An EE/CA and Action Memorandum for an NTCRA were prepared for Site 14 by the Navy in 1999. Removal and off-site disposal of contaminated soil and debris at the site was the recommended alternative in the Action Memorandum. A work plan for the removal action was prepared, and the removal action was completed in May 2001. Approximately 270 tons of debris and contaminated soil were removed and disposed off site. A post-removal action report was prepared to document the actions taken during the removal action. The actual cost of the NTCRA was not provided in the report, but the cost were estimated at \$200,000 in the Action Memorandum. A ROD (Navy, 2004b) signed for soil at the site (OU8) in September 2004 called for NFA. This remedy was selected because the NTCRA addressed all significant risks to human health and the environment associated with the soil and debris at the site.

The groundwater at Site 14 was further characterized during the BGOURI (TtNUS, 2002a). For the RI, Site 3 and Site 14 were evaluated collectively because Site 14 falls within the boundary of Site 3, and any impacts from Site 14 would be detected in groundwater beneath Site 3. Twenty-six groundwater samples were collected from Site 3 wells, but only one groundwater sample from the single Site 14 well was collected during the BGOURI. Groundwater results for Sites 3 and 14 indicated that water quality was generally good, with only sporadic, low-concentration detections of VOCs and metals in site monitoring wells. The VOCs were detected exclusively in Site 3 monitoring wells. Seven metals were the only chemicals detected in the Site 14 groundwater sample, and all concentrations were less than background groundwater concentrations. The HHRA determined that risks posed by exposure of construction workers to groundwater at Sites 3 and 14 are within USEPA and CTDEP acceptable levels, assuming that workers are exposed to the maximum observed concentrations of site contaminants. The HHRA also determined that risks posed by exposure of hypothetical future residents to groundwater at Sites 3 and 14 exceeded USEPA and CTDEP acceptable levels, assuming the residents are exposed to the maximum observed concentrations of site contaminants. Arsenic, benzo(a)pyrene, TCE, and vinyl chloride were the major contributors to the ILCRs, and thallium was the major contributor to the HIs. All of the chemicals that contributed significantly to the risks were detected in the Site 3 wells. The BGOURI recommended that an FS be prepared to evaluate the groundwater associated with Sites 3 and 14.

Site 14 groundwater was further evaluated in the BGOURI Update/FS Report (TtNUS, 2004). A supplemental HHRA evaluation was performed with the Site 14 groundwater data collected during the BGOURI, separate from the Site 3 groundwater data. The evaluation indicated no significant risks to potential receptors from exposure to Site 14 groundwater. Based on these results, NFA was recommended for Site 14 groundwater in the BGOURI Update/FS. An interim ROD (Navy, 2004h) signed for groundwater at the site (OU9) in December 2004 called for NFA.

### 11.3 REMEDIAL ACTIONS

### 11.3.1 Remedy Selection

The investigation of Site 14 soil identified minimal organic contamination, including low concentrations of VOCs, PAHs, and pesticides, and slightly more significant inorganic contamination (e.g., arsenic and lead). The HHRA indicated that risks to potential receptors associated with Site 14 soil were minimal; however, the results of the ERA indicated that the chemicals detected in Site 14 soil could adversely impact ecological receptors. An NTCRA was conducted at Site 14 in 2001. By removing all debris and contaminated soil with concentrations greater than the remedial goals that were protective of human health and ecological receptors [i.e., combination of ecological-based goals selected for the Site 3 (OU3) remedial action and Connecticut GB Pollutant Mobility Criteria], all site-related risks were addressed, and

no future adverse health affects are anticipated from exposure to Site 14 soil. The remedy selected for Site 14 soil in the ROD was NFA under CERCLA.

No significant contamination was discovered in groundwater at Site 14 during the BGOURI; therefore, the selected remedy was NFA. The NFA remedy for groundwater at Site 14 is an interim remedy, but it is expected that it will be the final remedy after remedial actions are selected for all portions of OU9.

### 11.3.2 Remedy Implementation

The selected remedies for Site 14 soil and groundwater were NFA; therefore, remedy implementation is not a concern for Site 14.

# 11.3.3 System Operations/Operation and Maintenance

O&M is not required at Site 14 because the selected remedies for Site 14 soil and groundwater were NFA.

### 11.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 14. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

The post-removal action report should be completed to document the NTCRA. The results of the confirmatory sampling and post-removal action risk analysis should be documented in the report.

A Final Removal Action Report was completed in 2002.

A NFA decision document should be prepared for the soil OU.

An NFA ROD for Site 14 soil (OU8) was signed in 2004.

The FS for the groundwater OU at the site should be completed to determine the appropriate remedial alternatives for groundwater.

Site 14 groundwater was evaluated in the BGOURI Update/FS that was completed in 2004. An
Interim ROD for Site 14 groundwater, which is a part of OU9, was signed in 2004. The selected
remedy for groundwater was NFA.

It is recommended that there be enforcement of the IR Site Use Restriction Instruction.

The instruction was enforced at Site 14 until the RODs were signed in 2004. Because there are no
remaining unacceptable risks related to Site 14 soil and groundwater, enforcement of the instruction
at Site 14 is not necessary in the future.

### 11.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 11.5.1 <u>Document Review</u>

The documents reviewed for the second five-year review are listed below, and key information obtained from the documents is summarized in the following sections.

BGOURI	January 2002
Final Removal Action Report	February 2002
BGOURI Update/FS	July 2004
Proposed Plan for Site 7 Torpedo Shops and Site 14 OBDANE Soil (OU8)	July 2004
ROD for Site 7 - Torpedo Shops and Site 14 - OBDANE Soil (OU8)	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater	December 2004

### 11.5.2 Data Review

Monitoring and O&M were not necessary for this site; therefore, there were no data available for review.

### 11.5.2 ARAR and Site-Specific Action Level Changes

No changes have occurred in ARARs or site-specific action levels that would affect the remedial goals selected in the Action Memorandum and used to complete the NTCRA. The selected remedies for Site 14 soil and groundwater in the RODs were NFA.

# 11.5.3 Site Inspection and Site Interviews

Because the selected remedies for soil and groundwater were NFA, no site inspection or site interviews were performed.

### 11.6 ASSESSMENT

The following conclusions support the determination that the remedy for the Site 14 is currently protective of human health and the environment.

### Question 1. Is the remedy functioning as intended by the decision documents?

The remedies for both soil and groundwater are NFA.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the Action Memorandum and ROD for Site 14 soil and the ROD for Site 14 groundwater were reviewed, and no changes have occurred that would change the selected remedies of NFA.
- Changes in Exposure Pathways: There have been no changes at the site that would have resulted in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in human health toxicity criteria that would impact the selected remedy of NFA for Site 14 soil and groundwater.
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the RODs for Site 14 soil and groundwater that would impact the protectiveness of the remedies.
- Expected Progress Towards Meeting RAOs: The RAOs for Site 14 soil (OU8) were met by
  excavating and disposing of contaminated soil with concentrations in excess of the remedial goals at
  an approved disposal facility. The remedy selected for Site 14 groundwater was NFA; therefore,
  RAOs were not required.

# Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

### 11.7 ISSUES

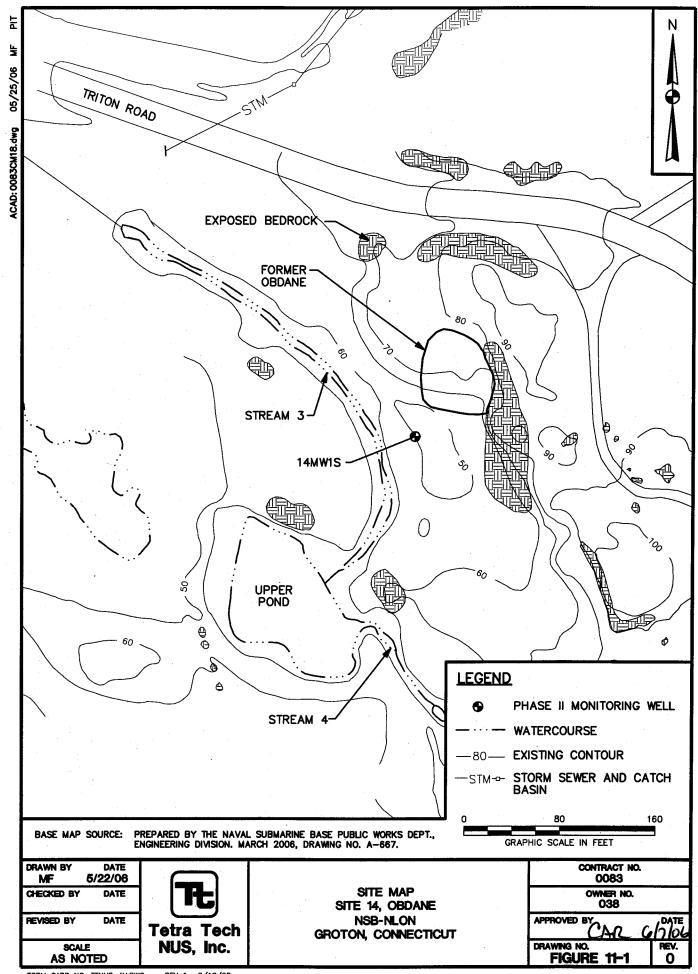
Monitoring well 14MW1S has not been abandoned. Because no additional sampling is required from the well, the well should be properly abandoned.

# 11.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that no additional five-year reviews of Site 14 be completed because the remedies implemented at the site did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure. It is also recommended that a well abandonment program be developed and implemented to properly abandon monitoring well 14MW1S.

### 11.9 PROTECTIVENESS STATEMENT

The remedy is protective of human health and the environment because all debris and contaminated soil with concentrations greater than the remedial goals was removed, and there are no unacceptable risks to human health or the environment from current or potential future exposure to soil or groundwater at Site 14.



# 12.0 SITE 15 – SPENT ACID STORAGE AND DISPOSAL AREA (OU6 AND OU9)

This five-year review is being conducted for Site 15 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. An Action Memorandum and TCRA were completed at the site in 1995. The TCRA resulted in no hazardous substances remaining in soil at the site that would limit use or restrict exposure. An NFA remedy was selected in the ROD for Site 15 soil (OU6) in 1997 (Navy, 1997b). Further evaluation of Site 15 groundwater, a portion of OU9, indicated no contaminants in groundwater that would limit use or restrict exposure. An Interim ROD for Site 15 groundwater (Navy, 2004h) was signed, and the selected remedy was NFA. It is expected that NFA will be the final remedy for Site 15 groundwater after remedial actions are selected for all portions of OU9.

### 12.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 15 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Temporary storage of waste battery acid.	World War II
	period
Final IAS completed.	1983
Phase I RI completed.	1992
Draft FFS completed.	1994
Action Memorandum completed.	1995
TCRA completed.	1995
Final Report for Soil Remediation at Site 15 completed.	1995
Phase II RI completed.	March 1997
ROD for Site 15 soil signed.	September 1997
First Five-Year Review completed.	December 2001
BGOURI completed.	January 2002
BGOURI Update/FS completed.	July 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) completed.	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater signed.	December 2004

### 12.2 BACKGROUND

The SASDA was located in the southeastern section of NSB-NLON, between the southern sides of Buildings 409 and 410. Figure 12-1 displays the general site arrangement. Figure 1-2 shows the location

of the site relative to the other IR sites at NSB-NLON. The site consisted of a concrete storage pad and an underground storage tank.

According to previous reports (Atlantic, 1994b), the area was used for storage and disposal of discarded batteries. Acid was removed from the battery housings and temporarily stored in a 4- by 4- by 12-foot, rubber-coated, underground tank. The acid was periodically emptied from the tank by a pumper truck and disposed off site. The battery housings were temporarily stored on the adjacent concrete pad. The former tank and the surrounding soils encompassed approximately 1,000 square feet.

All battery acid and housing storage at the site was terminated and the acid storage tank was filled with soil and covered by a concrete pad (Atlantic, 1994b). Future plans for this area included the demolition of Buildings 409 and 410 and the construction of a warehouse.

Site 15 was investigated during the Phase I RI (Atlantic, 1992) and an FFS (Atlantic, 1994b). Soil and groundwater samples were collected and analyzed during the investigations to characterize the site and to determine appropriate remedial alternatives. The results of the RI and FFS suggested that a removal action should be completed to address the tank and associated contamination. An Action Memorandum was prepared and a TCRA was completed by OHM in January 1995. The tank, 318 tons (200 cubic yards) of lead-contaminated soil, contaminated pavement, and the tank contents were removed and disposed off site. The September 1995 Final Report for Soil Remediation (OHM, 1995b) indicated that all soil around and beneath the spent acid tank to a depth of 4 feet below ground surface, or with a total lead concentration of 500 mg/kg or more, or a TCLP extract lead concentration of 5.0 mg/L or more, was excavated and properly disposed. The excavated area was filled with clean borrow material and covered with bituminous pavement.

The site was further evaluated during the Phase II RI (B&RE, 1997a). The soil OU at Site 15 was designated as OU6, and Site 15 groundwater is part of OU9. The Phase II RI included the collection and analysis of soil and groundwater samples from the site. The field investigation was conducted prior to the TCRA, but the only data evaluated during the RI were associated with sample locations that were not excavated during the TCRA. This approach provided an assessment of post-TCRA conditions at the site. The RI recommended that limited additional sampling be completed to verify that the remaining soil did not contain significant contaminant concentrations that would impact the groundwater beneath the site. The RI also recommended that if the sampling results confirmed that the soil would not impact groundwater, an NFA decision document should be prepared for soil.

Based on the recommendations of the Phase II RI, the CTDEP completed additional sampling and analysis at the site in 1997. The results of this sampling indicated that remaining concentrations of

inorganics in soil did not present a contaminant migration concern between soil and groundwater. Using these results, the Navy subsequently prepared an NFA Source Control ROD for the site. The ROD was signed in September 1997 (Navy, 1997b).

The groundwater associated with this site was further characterized as part of the BGOURI (TtNUS, 2002a). The objective of the BGOURI was to further characterize the nature and extent of groundwater contamination to determine if the TCRA was successful and to quantify the risks to potential human receptors associated with groundwater at the site. Groundwater samples were collected from four existing groundwater monitoring wells, and the results indicated that residual contamination (i.e., metals in soil) from the former SASDA was impacting groundwater. Because groundwater at the site was found to be relatively acidic, it was hypothesized that the lead and other metals detected in groundwater will be mobile and migrate from the site. The data also indicated that a source of TCE that is unrelated to the site is impacting Site 15 groundwater. The HHRA results from the BGOURI indicated that Site 15 groundwater does not pose any significant risks to construction workers, but it does pose potential risks to hypothetical future human receptors. Carcinogenic risks for future adult residents exposed to Site 15 groundwater were less than or within acceptable risk levels, but noncarcinogenic risks for future adult residents exposed to Site 15 groundwater exceeded the acceptable level of 1.0 under the RME scenario. Although not evaluated in the HHRA, potential risks to future child residents resulting from exposures to groundwater would also be expected to marginally exceed acceptable risk levels. Chromium and silver were the major contributors to the noncarcinogenic risks. The BGOURI recommended that an FS be prepared for Site 15 groundwater to address contaminant migration issues and the potential risks to hypothetical residential users associated with metals.

A DGI was conducted in the fall of 2002 and presented in the BGOURI Update/FS (TtNUS, 2004). The data collected during the DGI were used to confirm the nature and extent of contamination associated with Site 15 soil and groundwater and to determine the risks to human receptors from exposure to Site 15 media. The sampling program was focused on the groundwater contaminants (e.g., TCE, chromium, and silver) identified during the BGOURI. The DGI results indicated that no contamination remaining in soil is acting as a source of contamination to the groundwater and that there is no significant groundwater contamination at the site. The HHRA and data screening results indicated that there are no groundwater or soil COCs for the site. Comparison of the Phase II RI and DGI analytical results to the BGOURI results indicated that the BGOURI results were anomalies and were not representative of site conditions. The cause(s) of the BGOURI anomalies may have been the field sampling methodology and/or laboratory issues. Based on the results of the DGI, it was recommended that the existing NFA ROD for Site 15 soil did not need to be amended and that an NFA decision document should be prepared for Site 15 groundwater.

A Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater at NSB-NLON was released for public comment on September 24, 2004. The Interim ROD for groundwater was subsequently signed in December 2004.

### 12.3 REMEDIAL ACTIONS

# 12.3.1 Remedy Selection

A TCRA was completed at this Site 15 in January 1995. The results of the Phase I RI and the FFS were used to determine that a removal action was necessary. An Action Memorandum was prepared to document the decision process used to select the removal action. The remedial goals for the removal action were 500 mg/kg for total lead in soil and 5.0 mg/L for TCLP lead extract. After the TCRA and subsequent investigations were completed, it was determined that the soil OU at the site did not pose unacceptable risks to human health or the environment. Subsequently, a NFA Source Control ROD was signed for the site in September 1997. Based on the results of the DGI, it was determined that there was no need to amend the existing NFA ROD for OU6.

The BGOURI DGI analytical results indicated that the groundwater at Site 15 did not pose any significant risks to human health or the environment. Because there were no unacceptable risks and no COCs associated with the site's groundwater, a NFA remedy was selected in an Interim ROD (Navy, 2004h). The NFA remedy is an interim remedy, but it is expected to be the final remedy once remedial actions are selected for all portions of OU9.

### 12.3.2 Remedy Implementation

The selected remedies for Site 15 soil and groundwater were NFA; therefore, remedy implementation is not a concern at Site 15.

### 12.3.3 System Operations/O&M

O&M is not required at Site 15 because the selected remedies for Site 15 soil and groundwater were NFA.

### 12.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 15. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

The BGOURI should be finalized and an FS should be completed for the groundwater OU. Additional investigations should be completed as necessary to develop appropriate remedial alternatives during the FS. The results of the RI and FS should be used to select an appropriate remedial action for the groundwater OU as well as determine whether the NFA ROD for soil should be revisited and revised.

A DGI was performed and the BGOURI was updated. Based on the results of the DGI, it was determined that there was no need to amend the existing NFA ROD for OU6. The RI Update also recommended that there was no need to prepare an FS for the groundwater OU at Site 15 and an NFA decision document should be prepared for the groundwater OU. A ROD for Site 15 groundwater was signed in 2004 and the selected remedy was NFA.

It is also recommended that there be continued enforcement of the IR Site Use Restriction Instruction, especially if the car wash is constructed at the site.

The instruction was enforced at Site 15 until the RODs were signed for the soil and groundwater.
 Because there are no hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, enforcement of the instruction at Site 15 is not necessary in the future.

### 12.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 12.5.1 Document Review

The following documents were reviewed for the second five-year review, and key information obtained from the documents is summarized in the following sections.

BGOURI	January 2002
BGOURI Update/FS	July 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater	December 2004

### 12.5.2 Data Review

Monitoring or O&M were not necessary for this site; therefore, there were no data available for review.

### 12.5.3 ARAR and Site-Specific Action Level Changes

No changes have occurred in ARARs or site-specific action levels that would affect the remedial goals selected in the Action Memorandum and used to complete the TCRA. The selected remedies for Site 15 soil and groundwater were NFA.

# 12.5.4 Site Inspection

Because the selected remedies for soil and groundwater were NFA, no site inspection was performed.

### 2.5.5 Site Interviews

No formal interviews were conducted for this site as part of the second five-year review because there were not active site issues to discuss.

### 12.6 ASSESSMENT

The following questions were answered to determine if the remedy at Site 15 is protective of human health and the environment.

Question 1. Is the remedy functioning as intended by the decision documents?

The remedies for both soil and groundwater are NFA.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the Action Memorandum and ROD for Site 15 soil and the ROD for Site 15 groundwater were reviewed and no changes have occurred that would change the selected remedies of NFA.
- Changes in Exposure Pathways: Potential changes in site conditions that could affect exposure pathways were identified during the first five-year review. A change in land use at the site from a parking lot to a car wash was planned. Short-term exposure to site soil and groundwater could have occurred during construction of the car wash. However, the plans were never implemented, and the site remains a parking lot. No changes in site conditions are expected in the near future.

- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in the human health toxicity criteria that would impact the selected remedy of NFA for Site 15 soil and groundwater.
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the RODs for Site 15 soil and groundwater that would impact the protectiveness of the remedies.
- Expected Progress Towards Meeting RAOs: The RAOs for Site 15 soil (OU6) were met by completing the TCRA which involved removing the tanks, excavating contaminated soil, and disposing the contaminated soil at an approved off site disposal facility. The remedy selected for Site 15 groundwater was NFA; therefore, RAOs were not required.

# Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

### 12.7 ISSUES

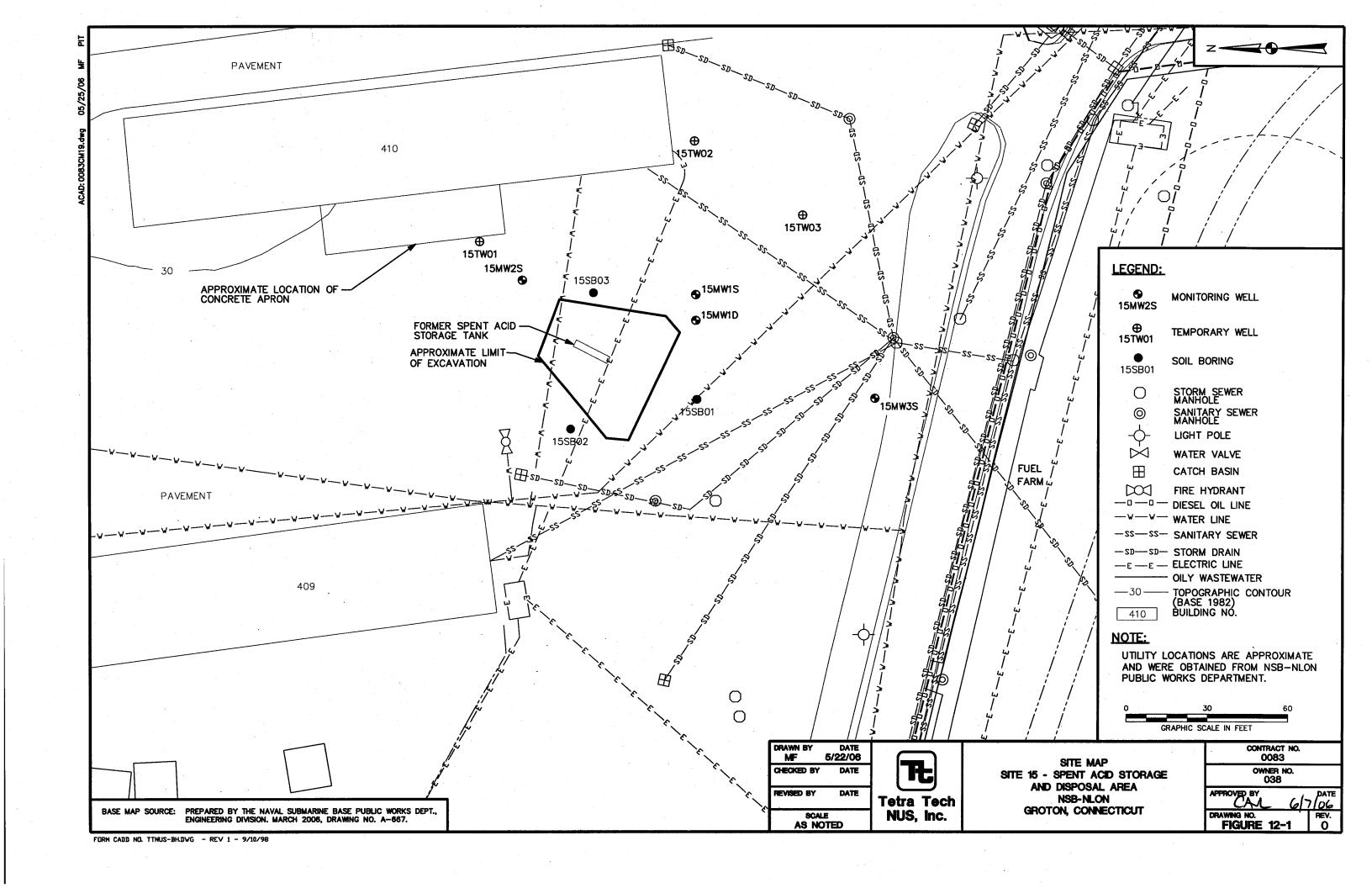
The monitoring wells at Site 15 have not been properly abandoned. Because no additional sampling is required from the wells, they should be properly abandoned.

### 12.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that no additional five-year reviews of Site 15 be conducted because the remedies implemented at the site did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of action levels that allow for unlimited use and unrestricted exposure. It is also recommended that a well abandonment program be developed and implemented to properly abandon monitoring wells at Site 15.

# 12.9 PROTECTIVENESS STATEMENT

The remedy is protective of human health and the environment because the TCRA removed all soil with concentrations of COCs greater than the remedial goals, and there are no unacceptable risks to human health or the environment from current or potential future exposure to groundwater at Site 15.



# 13.0 SITE 16 - HOSPITAL INCINERATORS (OU11)

This five-year review is being conducted for Site 16 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Investigation of Site 16 did not identify any hazardous substances that would limit use or restrict exposure. A ROD for Site 16 soil OU (OU11) was signed in 2004 (Navy, 2004g), and the selected remedy was NFA. No groundwater was encountered at Site 16.

### 13.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 16 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Naval Hospital Groton operated skid-mounted waste incinerator.	1980s
IAS completed.	1983
FFA signed.	1995
First Five-Year Review performed.	December 2001
BGOURI completed.	January 2002
Proposed Plan for Sites 16 and 18 Soil (OU11) issued.	July 2004
ROD for Sites 16 and 18 Soil (OU11) signed.	September 2004

### 13.2 BACKGROUND

Site 16 consists of the two former locations where the skid-mounted hospital incinerator was reportedly located. In the 1980s, the Naval Hospital Groton operated the skid-mounted waste incinerator at two sites adjacent to the base hospital. The two sites (16-A and 16-B) are located west of Tautog Road, adjacent to Building 449 and Building 452. The site map is included as Figure 13-1. The location of the site relative to other IR sites is shown on Figure 1-2.

According to the FFA, the incinerator was used to destroy medical records and medical waste contaminated with pathological agents. Ash generated by the waste incinerator was transferred by dumpster and disposed at the municipal landfill.

Site 16 was evaluated during the IAS (Envirodyne, 1983) for NSB-NLON that was conducted in March 1983. No sampling activities were conducted as part of the study. The study's recommendation for this

site was that no further investigation was necessary because, at the time of the IAS study, the site was still operational. As a result of this, no investigation of Site 16 was conducted during either the Phase I or the Phase II RIs. The Navy subsequently ceased operations of the incinerator at the hospital.

The site was investigated during the BGOURI (TtNUS, 2002a) to determine the impact of the operation of the incinerator. The objectives of the BGOURI at Site 16 were to perform an initial characterization of the nature and extent of contamination at the site and to quantify the risks to human receptors associated with the site. Risks to ecological receptors were not evaluated during the RI, in accordance with the final work plan, because the site is paved.

The BGOURI focused on soil at Site 16. Surface and subsurface soil samples were collected for analysis during test boring activities. Temporary groundwater monitoring wells were not installed at Site 16 because shallow bedrock was encountered (at 3 feet below ground surface), the depth to groundwater was estimated at 70 feet below ground surface, and the potential site contaminants (dioxins/furans, PCBs, and metals) and release mechanism (skid-mounted incinerator) would typically not impact groundwater.

In addition to the sampling and analytical program, interviews were conducted during the BGOURI to obtain historical information about the incinerator. Personnel at the Naval Groton Hospital (i.e., the director of records and the regional coordinator) and the NSB-NLON Public Works Department were contacted regarding this issue. None of the personnel knew any historical information about the incinerator or could provide any insight into its operation.

The nature and extent of contamination and HHRA results from the BGOURI indicated that past operation of the skid-mounted incinerator at Site 16 did not significantly impact the surrounding soil and the site soils do not pose significant risks to any potential human receptors. All ILCRs for exposure to soil at Site 16 were less than or within USEPA's target risk range and CTDEP's acceptable risk level for cumulative exposures. All HIs for exposure to soil at Site 16 were less than USEPA's and CTDEP's acceptable level of 1.0. Several chemicals were detected at concentrations that exceeded screening criteria for contaminant migration from soil to groundwater; however, upon further screening they were determined not to pose significant contaminant migration concerns.

The results of the BGOURI did not indicate that subsequent rounds of investigation were necessary to further characterize Site 16. In addition, the results did not suggest that an FS was necessary for the site. Therefore, the BGOURI recommended that an NFA decision document be prepared for the site (TtNUS, 2002a). NFA was selected for Site 16 soil and was documented in the September 2004 ROD (Navy, 2004g).

### 13.3 REMEDIAL ACTIONS

### 13.3.1 Remedy Selection

Based on the results of the BGOURI, NFA was recommended for the site. A Proposed Plan was prepared in July 2004, and the NFA ROD was signed in September 2004.

# 13.3.2 Remedy Implementation

Remedy implementation is not a concern for Site 16 because the selected remedy is NFA.

# 13.3.3 System Operations/O&M

O&M is not required at Site 16 because the selected remedy is NFA.

### 13.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 16. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It is recommended that a NFA PRAP and ROD be prepared for this site.

 The Proposed Plan was issued for public comment in July 2004, and the NFA ROD was signed in September 2004.

In addition, it is recommended that there be enforcement of the IR Site Use Restriction instruction.

The instruction was enforced at Site 16 until the ROD was signed for OU11. Because there are no
hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for
unlimited use and unrestricted exposure, enforcement of the instruction at Site 16 is no longer
necessary.

### 13.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 13.5.1 Document Review

The following documents were reviewed for the second five-year review:

BGOURI	January 2002
Proposed Plan for Sites 16 and 18 Soil (OU 11)	July 2004
ROD for Sites 16 and 18 Soil (OU 11)	September 2004

### 13.5.2 Data Review

Monitoring and O&M were not necessary for this site because of the NFA remedy; therefore, there was no data available for review.

### 13.5.3 ARAR and Site-Specific Action Level Changes

No new human health or ecological ARARs have been promulgated that would call into question the protectiveness of the NFA remedy.

# 13.5.4 <u>Site Inspection</u>

Because the selected remedy for the site was NFA, no site inspection was performed.

### 13.5.5 Site Interviews

No formal interviews were conducted for this site as part of the second five-year review because there were not active site issues to discuss.

### 13.6 ASSESSMENT

The following questions were answered to determine if the remedy for the Site 16 is protective of human health and the environment.

# Question 1. Is the remedy functioning as intended by the decision documents?

The remedy for Site 16 OU11 was NFA.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the ROD
  were reviewed, and no changes have occurred that would change the selected remedy of NFA.
- Changes in Exposure Pathways: There have been no changes at the site that would have resulted in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in human health toxicity criteria that would impact the selected remedy of NFA for Site 16 soil (OU11).
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the ROD that will impact the protectiveness of the remedy.
- Expected Progress Towards Meeting RAOs: The remedy selected for Site 16 soil was NFA; therefore, RAOs were not required.

# Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

### **13.7 ISSUES**

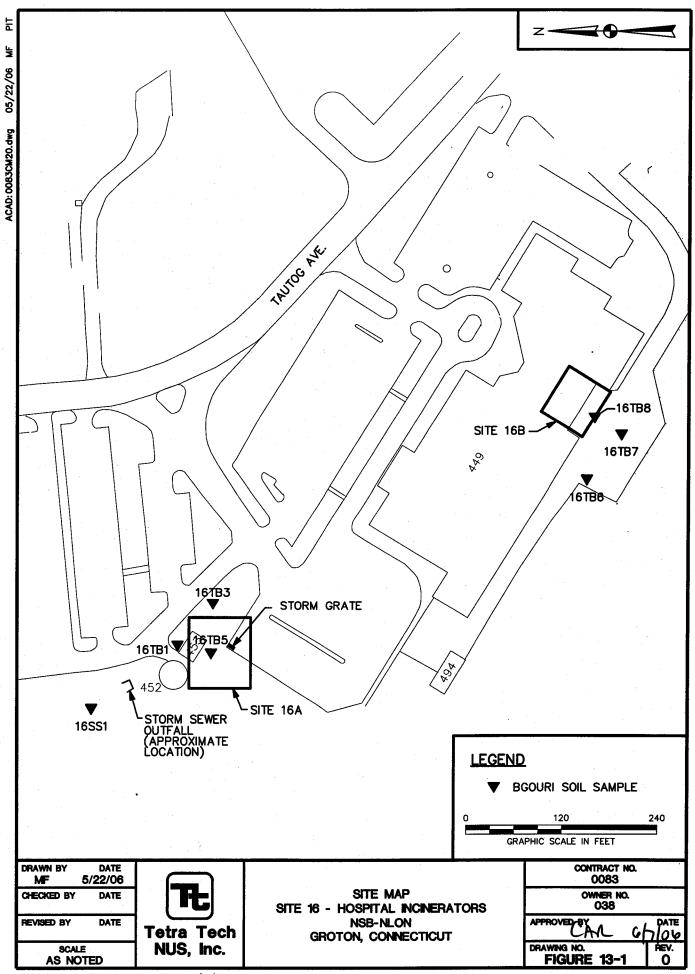
No deficiencies were identified for Site 16.

### 13.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that no additional five-year reviews of Site 16 be conducted because the remedy implemented at the site did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of action levels that allow for unlimited use and unrestricted exposure. An NFA Proposed Plan and ROD were prepared for Site 16 soil (OU11).

# 13.9 PROTECTIVENESS STATEMENT

Because the remedy did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, the NFA remedy for Site 16 is protective of human health and the environment.



# 14.0 SITE 17 – LOWER SUBASE - HAZARDOUS MATERIALS/SOLVENT STORAGE AREA – BUILDING 31 (OU4)

This five-year review is being conducted for Site 17 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. A TCRA was completed at Site 17 in 1995, but not all contamination was removed during the TCRA that would allow for unlimited use and unrestricted exposure. This site is still being investigated under CERCLA, and no decision documents have been prepared for the site.

### 14.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 17 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Building 31 constructed near Pier 6 on Albacore Road.	1917
Building 31 used as a battery shop.	1950s
Building 31 used as the main hazardous/flammable materials warehouse.	1970s
Final Site Investigation Subsurface Soil Contamination report completed.	1987
Yellow discoloration discovered in soil beneath the floor slab, and elevated levels of lead detected. Phase I RI completed.	1992
Action Memorandum for Building 31 completed.	1993
TCRA for lead-contaminated soil at Building 31 completed.	1995
Post-Removal Action Report completed.	1995
Leak testing investigation for fuel oil distribution system completed.	1996
Existing Data Summary Report for Lower Subase RI completed.	1997
Phase II RI Report completed.	1997
Final Lower Subase RI Report completed.	1999
First Five-Year Review performed.	December 2001
Above-ground portion of Building 31 demolished.	2001-2002
Draft Final FS for Soil and Groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

### 14.2 BACKGROUND

Building 31 was constructed in 1917 and was originally used as a battery shop until the mid-1950s. Battery overhaul was one of the largest operations conducted at the Subase prior to nuclear power. Old

diesel submarines, containing approximately 100 batteries, were routinely serviced in the Battery Overhaul Shop at Building 31. Services ranged from charging batteries to complete battery overhaul. Spent acid from the overhauled batteries was disposed in a spent acid tank located at the SASDA - Site 15 (Envirodyne, 1983).

Building 31 was used as the main hazardous/flammable materials warehouse starting in the 1970s. Items such as sulfuric acid, methyl isobutyl ketone, potassium hydroxide, potassium tetraborate, hydrofluoric acid, and nitric acid were stored in containers of up to 55-gallon capacity. In 1992, while the concrete floor of the building was being replaced to comply with RCRA regulations, a yellow discoloration was discovered in soil beneath the floor slab. Analysis of soil samples revealed elevated levels of lead. As a result, an Action Memorandum was prepared (HNUS, 1993a) to document the need to remediate lead-contaminated soil to a depth of 1 foot below the water table. The TCRA was completed in 1995 (HNUS, 1995). Lead-contaminated soil to 1 foot below the water table was remediated to concentrations less than 500 mg/kg and TCLP lead results less than 5.0 mg/L during the TCRA. Some contaminated soil was left in place in the areas between Building 31 and the Thames River front because its removal would have interfered with Subase traffic. The location of Site 17 relative to other IR sites is shown on Figure 1-2.

During subsequent investigations, Site 17 – Hazardous Materials/Solvent Storage Area (Building 31) has been included in Zone 3 of the Lower Subase, which extends from Capelin Road along the southern end of Zone 2 to the southern side of Bullhead Road. Zone 3 includes Site 17, fuel oil distribution lines, and steam, condensate, and electrical ducts. The Providence and Worcester Railroad borders the eastern edge of Zone 3, and the Thames River lies to the west of it. Figure 14-1 illustrates the Zone 3 and Site 17 boundaries, fuel oil distribution lines, steam and condensate lines, and sewer lines within this zone. Because of this approach, the remainder of this section discusses information in terms of Zone 3.

Fuel oil distribution lines and utility ducts and trenches run through Zone 3. The locations of the distribution lines and utility ducts are shown in Figure 14-1. In 1996, pressure leak testing was performed on the lines and valves in the fuel distribution system within Zone 3. All sections of the line and various valves tested in the portion of the distribution system within Zone 3 passed the pressure testing procedures.

The Lower Subase RI (TtNUS, 1999b) recommended that Zone 3 proceed to an FS. Because of the extensive amount of underground utilities in Zone 3 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus on the evaluation of alternatives that rely on institutional controls to limit exposure to contaminated soil and a tiered groundwater monitoring program to verify that significant contaminant migration is not occurring. Hot spot removal

actions for lead contamination and cleaning and repair of the Zone 3 storm sewer system should also be evaluated during the FS. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in soil and groundwater are well
  defined to the extent practical considering infrastructure limitations.
- The baseline HHRA indicated that risks associated with Zone 3 are within the USEPA acceptable risk range. There are carcinogenic risks in excess of the CTDEP target risk level to human receptors, but only under the hypothetical future resident scenario. In addition, modeling performed to evaluate exposure to lead showed that sensitive receptors to lead exposure (i.e., children and fetuses of pregnant women) are only at risk in Zone 3 under a future hypothetical scenario, which assumes that soils currently covered by pavement or buildings are available for exposure. Institutional controls and/or hot spot removal actions could be used to eliminate this exposure route.
- Although reported concentrations of TPH in site soil samples exceeded the State RSRs for direct
  exposure and pollutant mobility, the chemical-specific risk assessment for those compounds
  assumed to be major constituents of the observed TPH contamination indicated minimal risks to
  potential receptors.
- The groundwater at Zone 3 is not currently or anticipated to be used in the future as a potable water source because it is brackish (CTDEP-classified as GB); therefore, there is no imminent threat to human health.
- The data do not suggest that petroleum contamination in soil is significantly migrating to groundwater. In addition, natural attenuation processes seem to be at work in the groundwater.
   These processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Groundwater monitoring will confirm this information.
- Inorganics are potentially migrating from Zone 3 to the Thames River. However, the ERA for the
  Thames River adjacent to Zone 3 shows that the risks to ecological receptors in the sediment
  adjacent to Zone 3 are relatively low and that lead is not a significant threat to ecological receptors.
  Groundwater monitoring will confirm the contaminant migration.
- A tiered groundwater monitoring program will allow for further actions to be completed if results show significant impacts.

- The Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 3.
- The Navy completed a TCRA on soil contaminated with lead underneath and adjacent to Building 31;
   therefore, a majority of the lead-contaminated soil that historically acted as a source of contamination to other media has been remediated.
- The Navy conducts regular pressure testing and repairs on the fuel distribution lines; therefore, the historical source of petroleum contamination has most likely been eliminated.
- The zone is covered with pavement or buildings, which minimizes direct exposure to the contaminated soil by human receptors.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two catch basins in Zone 3 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

Building 31 was demolished in 2001. The building's foundation and floor slab were not disturbed during the demolition. Building 78, which was located adjacent to Building 31, was demolished in 2005, and a parking lot was constructed in the area formerly occupied by Buildings 31 and 78. Three inches of asphalt were placed over Building 31's floor slab, which covered the solidified waste material and contaminated soil remaining at Site 17, to make the parking lot. An FS is currently being prepared for Zone 3 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 3 will be selected after the FS is finalized.

### 14.3 REMEDIAL ACTIONS

### 14.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 3, which includes Site 17. A TCRA was completed to address lead-contaminated soil underneath and adjacent to the building. Based on the Action Memorandum, the TCRA included excavation and on-site solidification of soil with total lead concentrations greater than 500 mg/kg or TCLP leachate lead concentrations greater than 5 mg/L, on-site backfilling, and off-site disposal of contaminated debris. Design documents were prepared for the TCRA, and the TCRA was completed in 1995 (HNUS, 1993b and 1995).

An FS is currently being prepared to evaluate further remedial actions for the site. The Lower Subase RI recommended that the FS for Zone 3, which includes Site 17, evaluate, to the extent possible, alternatives that include institutional controls to limit exposure to contaminated soil and a tiered groundwater monitoring program. Hot spot removal actions for lead contamination should also be evaluated.

# 14.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 3. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

### 14.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 17. The recommendations from the First Five-Year Review Report are provided below along with the actions taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 3 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the Feasibility Study.

It was also recommended that during the demolition of Building 31, the foundation and floor slab not be disturbed.

Building 31 has been demolished. The location of former Building 31 is now a parking lot. Three
inches of asphalt were placed over Building 31's floor slab, which covered the solidified waste
material and contaminated soil remaining at Site 17, to make the parking lot.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction Instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 17.

### 14.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the 5-year review process and the actions taken to complete this review.

### 14.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second 5-year review of Site 17. Within the past 5 years, no other documents have been completed regarding this site.

### 14.5.2 Data Review

No new data were collected from the site over the past five years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

### 14.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 3; therefore, ARARs and sitespecific action levels have not been identified for Zone 3.

### 14.5.4 <u>Site Inspection</u>

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 3 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. It was noted during the site inspection that Buildings 31 and 78 in Zone 3 were demolished and that the area was now a parking lot. No issues were identified, and no photos of the zone were taken during the inspection. The Navy has no other plans to change the use of the site.

# 14.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

### 14.6 ASSESSMENT

Because a final remedy has not been selected for Zone 3, conclusions cannot be made to support the determination that the remedy for Zone 3 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under the current land use scenario.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

### **14.7 ISSUES**

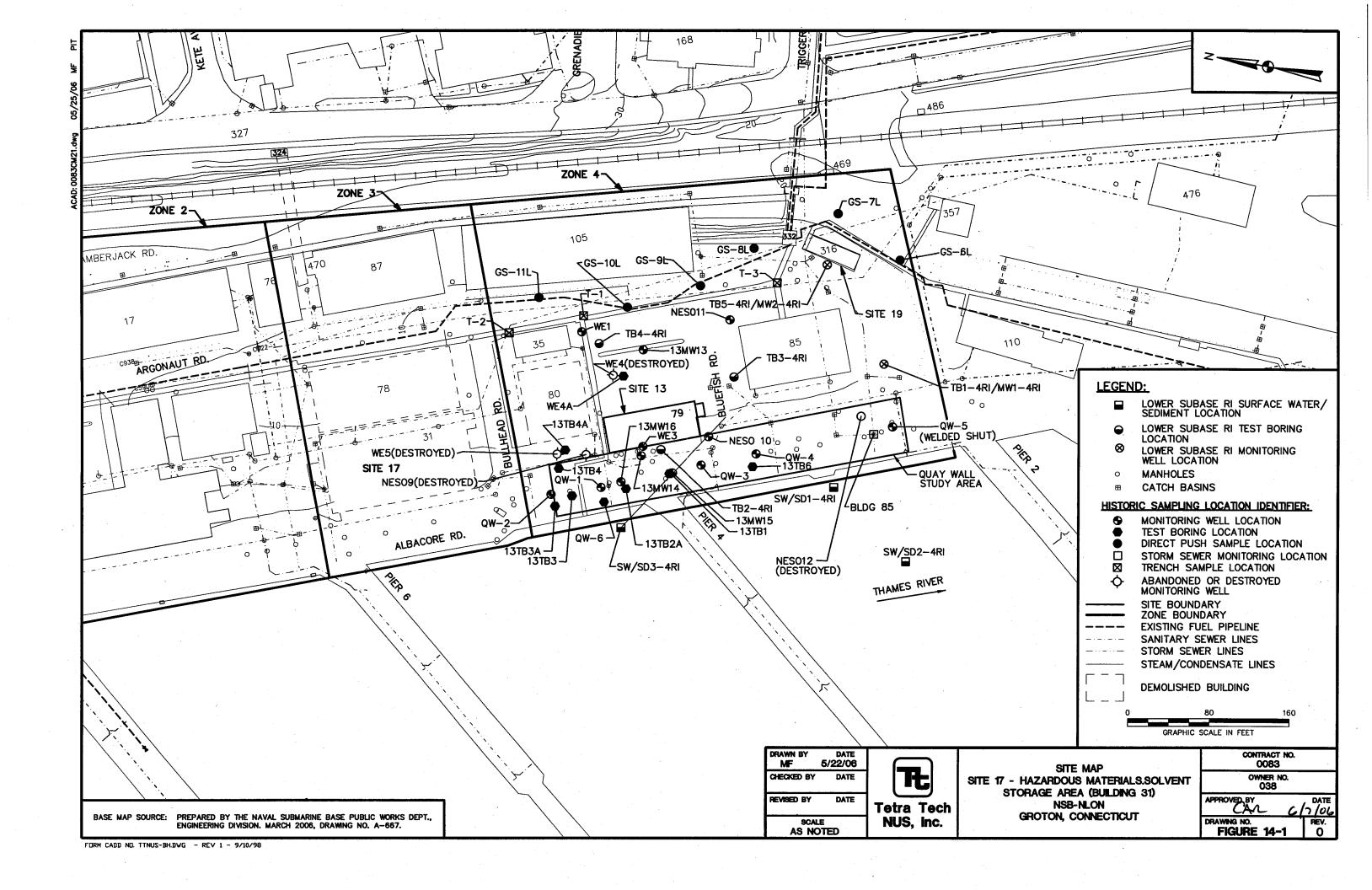
A final remedy has not been selected for Zone 3; therefore, deficiencies cannot be determined at this time.

# 14.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 3 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be enforcement of the IR Site Use Restriction Instruction.

### 14.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 3, which includes Site 17, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of the development of the FS.



## 15.0 SITE 18 – SOLVENT STORAGE AREA – BUILDING 33 (OU11 AND OU9)

This five-year review is being conducted for Site 18 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. An investigation of Site 18 found no hazardous substances in the soil or groundwater at the site that would limit use or restrict exposure. An NFA remedy was selected for Site 18 soil OU (OU11) in a ROD signed in 2004 (Navy, 2004g). An Interim ROD for Site 18 groundwater, a portion of OU9, was signed in 2004 (Navy, 2004h), and the selected remedy was NFA. It is expected that the NFA remedy will be the final remedy for Site 18 groundwater after remedial actions are selected for all portions of OU9.

#### 15.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 18 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Storage of 55-gallon drums of solvents and gas cylinders.	1980s
IAS identified solvent storage at Building 33.	1983
FFA identified site as Study Area F.	1995
First Five-Year Review performed.	December 2001
BGOURI completed.	January 2002
Proposed Plan for Sites 16 and 18 Soil (OU11) issued.	July 2004
ROD for Sites 16 and 18 Soil (OU11) signed.	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) completed.	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater signed.	December 2004

#### 15.2 BACKGROUND

Site 18 consists of Building 33, which is located east of Grayback Avenue. The site map is included as Figure 15-1. Several 55-gallon drums containing solvents, such as TCE and DCE, and some gas cylinders were stored in Building 33 (USEPA, 1995a). The solvent storage area was identified during the IAS (Envirodyne, 1983) for NSB-NLON that was conducted in March 1983. The site was identified as Study Area F in the FFA and is now identified as IRP Site 18.

No sampling activities were conducted at the site prior to the BGOURI. During the BGOURI (TtNUS, 2001e), soil and groundwater samples were collected to characterize Site 18. One objective of the RI at Site 18 was to perform an initial characterization of the nature and extent of contamination at the site because no sampling or analytical programs had been completed at the site in the past. Another objective of the RI was to quantify the risks to human receptors associated with the site.

During the RI, both surface and subsurface soil samples were collected and analyzed. Three temporary groundwater monitoring wells were installed; however, only two were sampled during the RI because one well was dry. The nature and extent of contamination and HHRA results from the RI indicated that past storage of solvents at Building 33 did not significantly impact the surrounding media and that the site does not pose significant risks to any potential human receptors. No significant concentrations of contaminants were detected in groundwater at Site 18. All carcinogenic risks from exposure to soil at Site 18 were less than or within acceptable risk levels, and all noncarcinogenic risks were less than the acceptable level of 1.0.

The results of the BGOURI did not indicate that subsequent rounds of investigation were necessary to further characterize the site. In addition, the results did not suggest that an FS was necessary for the site. Therefore, the RI recommended that an NFA decision document be prepared for this site. Separate RODs for Site 18 soil and groundwater (Navy, 2004g and 2004h, respectively) were prepared to document the NFA decisions. The selected NFA remedy for groundwater at Site 18 is an interim remedy, but it is expected that it will be the final remedy after remedial actions are selected for all portions of OU9.

## 15.3 REMEDIAL ACTIONS

#### 15.3.1 Remedy Selection

An investigation of Site 18 found no hazardous substances in soil or groundwater at the site that would limit use or restrict exposure. An NFA remedy was selected for Site 18 soil OU (OU11) in a ROD signed in 2004 (Navy, 2004g). An Interim ROD for Site 18 groundwater, a portion of OU9, was signed in 2004 (Navy, 2004h), and the selected remedy was NFA.

## 15.3.2 <u>Remedy Implementation</u>

The selected remedies for both soil and groundwater at Site 18 were NFA; therefore, remedy implementation is not a concern for Site 18.

## 15.3.3 System Operations/O&M

Monitoring and O&M are not required at Site 18 because the selected remedies for Site 18 soil and groundwater were NFA.

#### 15.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 18. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It is recommended that a NFA PRAP and ROD be prepared for this site.

 The Proposed Plan for Site 18 soil (OU11) was issued in July 2004, and the NFA ROD was signed in September 2004. The Proposed Plan for Site 18 groundwater (a portion of OU9) was issued in September 2004, and the NFA Interim ROD was signed in December 2004.

Also, it is recommended that there be enforcement of the IR Site Use Restriction instruction.

The instruction was enforced at Site 18 until the RODs were signed for soil and groundwater.
 Because there are no hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, enforcement of the instruction at Site 18 is not necessary in the future.

#### 15.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 15.5.1 Document Review

The following documents were reviewed for the second five-year review, and key information obtained from the documents is summarized in the following sections:

BGOURI	January 2002
Proposed Plan for Sites 16 and 18 Soil (OU11)	July 2004
ROD for Sites 16 and 18 Soil (OU11)	September 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater	December 2004

## 15.5.2 Data Review

Monitoring and O&M are not necessary for this site because of the NFA remedies; therefore, there were no additional data available for review.

## 15.5.3 ARAR and Site-Specific Action Level Changes

No new ARARs or site-specific action levels have been promulgated that would call into question the protectiveness of the remedy.

#### 15.5.4 Site Inspection

Because the selected remedy for the site was NFA, no site inspection was performed for Site 18.

#### 15.5.5 Site Interviews

No formal interviews were conducted for this site as part of the second five-year review because there were no active site issues to discuss.

#### 15.6 ASSESSMENT

The following conclusions support the determination that the NFA remedies for Site 18 are currently protective of human health and the environment.

## Question 1. Is the remedy functioning as intended by the decision documents?

The remedies for both soil and groundwater are NFA.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the RODs were reviewed, and no changes have occurred that would change the selected remedies of NFA.
- Changes in Exposure Pathways: There have been no changes at the site that would have resulted in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in human health toxicity criteria that would impact the primary or secondary monitoring criteria

- Changes in Risk Assessment Methods: There have been no changes in the HHRA methodology
  that would impact the protectiveness of the NFA remedies selected for Site 18 soil and groundwater.
- Expected Progress Towards Meeting RAOs: The remedies selected for Site 18 soil and groundwater were NFA; therefore, RAOs were not required.

## Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

## 15.7 ISSUES

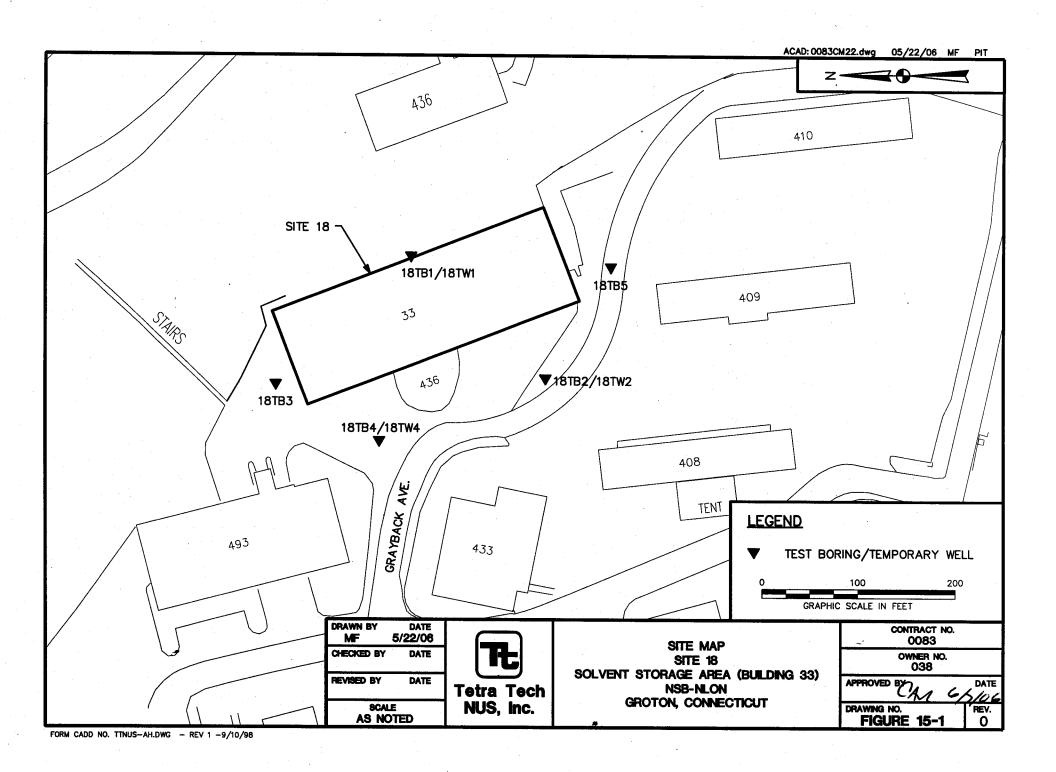
No deficiencies were identified for Site 18.

#### 15.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that no additional five-year reviews of Site 18 be conducted because the remedies implemented at the site did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of action levels that allow for unlimited use and unrestricted exposure. NFA Proposed Plans and RODs were prepared for Site 18 soil and groundwater.

## 15.9 PROTECTIVENESS STATEMENT

Because the remedies do not result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, the NFA remedies for Site 18 soil and groundwater are protective of human health and the environment.



# 16.0 SITE 19 – LOWER SUBASE – SOLVENT STORAGE AREA – BUILDING 316 (OU4)

This five-year review is being conducted for Site 19 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 19 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 16.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 19 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Solvents stored in Building 316.	NA
Existing Data Summary Report for Lower Subase RI completed.	1997
Final Lower Subase RI completed.	1999
First Five-Year Review performed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

#### 16.2 BACKGROUND

Site 19 – Solvent Storage Area, Building 316, is located in the Lower Subase, west of Pier 2. The site map is included as Figure 16-1. Several 5-gallon cans containing methyl ethyl ketone were stored in Building 316 (USEPA, 1995a). Solvents are no longer stored in this facility.

Soil and groundwater sampling and analysis were conducted at this site, included as part of Zone 4, during the Lower Subase RI (TtNUS, 1999b). Because of this approach, the remainder of this section discusses information in terms of Zone 4.

The Lower Subase RI (TtNUS, 1999b) recommended that Zone 4 proceed to an FS to evaluate appropriate remedial alternatives. Because of the extensive amount of underground utilities in Zone 4 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus, to the extent possible, on evaluation of alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives. In addition, the

Zone 4 FS should consider hot spot removal actions in lieu of full-scale excavation. A tiered groundwater monitoring program and cleaning and repair of the Zone 4 storm sewer system should also be evaluated during the FS. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in soil and groundwater are well
  defined to the extent practical considering infrastructure limitations.
- The baseline HHRA indicates that carcinogenic risks associated with Zone 4 exceed the USEPA acceptable risk range (i.e., the hypothetical future resident RME scenario) and CTDEP target risk level (i.e., the full-time employee and hypothetical future resident RME scenarios). In addition, modeling performed to evaluate exposures to lead showed that receptors sensitive to lead exposure (i.e., small children and fetuses of pregnant working women) are at risk in Zone 4. All the elevated risks (for lead and other chemicals) were calculated for a future exposure scenario where soils currently covered by pavement or buildings would be available for human contact. Institutional controls and/or hot spot removal actions could be used to eliminate this exposure route.
- Evidence suggests that limited organic and inorganic contamination is migrating from the site.
   Natural attenuation seems to be occurring in the groundwater of Zone 4 and is most likely reducing the concentrations of petroleum hydrocarbons migrating from the site. Groundwater monitoring will confirm natural attenuation and potential inorganic migration.
- Natural attenuation or bioremediation could be feasible alternatives to address petroleum contamination in soil.
- A tiered groundwater monitoring program would allow for further actions to be implemented if results show significant impacts.
- The ERA for the Thames River adjacent to Zone 4 shows that the risks to ecological receptors in this area are relatively low to moderate. Maximum concentrations of several non-AVS inorganics in Zone 4 sediments near the Lower Subase exceeded conservative guidelines (e.g., ER-Ls), indicating that potential risks may be present. Beryllium, boron, cobalt, thallium, and vanadium were retained as COCs because conservative sediment guidelines were unavailable. No alternate guideline was available for barium, the maximum concentration of which exceeded the conservative guideline. The COCs were concluded to not be of ecological significance in the NSB-NLON Phase II RI ERA for the Thames River. Benzo(a)pyrene was the only organic in Zone 4 sediments that had maximum concentrations in excess of guidelines. The average concentration of benzo(a)pyrene also exceeded the guideline. The maximum concentration slightly exceeded its ER-M. Despite exceedances of

guideline values by several COCs, no significant toxicity was observed in Zone 4 sediment toxicity tests from the NSB-NLON Phase II RI. Low concentrations of some PAHs were detected in a native blue mussel sample collected in Zone 4 as part of the NSB-NLON Phase II RI ERA. Chromium, mercury, and benzo(a)pyrene was not detected in that sample, indicating that they were probably not bioavailable. Boron was detected in the blue mussel sample from Zone 4 and in the blue mussel sample collected south of Zone 4 at concentrations greatly exceeding background and control concentrations. The toxicological significance is unclear due a lack to toxicity data for that metal. The NSB-NLON Phase II RI concluded that boron was not of ecological significance in the Thames River. The weight of evidence appears to indicate that potential risks to sediment-dwelling organisms from contaminants in Zone 4 sediment are present and that these potential risks are low to moderate.

- The Thames River provides significant dilution and mixing, which minimize the impact of contaminant migration from Zone 4.
- The Navy removed the waste oil pit at Building 79 and filled the area with concrete. A recovery well system was installed and operated for a short time in this area. In addition, approximately 800 gallons of petroleum product were removed via pumping from the quay wall area during a removal action in 1994.
- The Navy currently conducts regular pressure testing and repairs on the fuel distribution lines;
   therefore, the historical source of petroleum contamination has most likely been minimized.
- Zone 4 is covered with pavement or buildings, which minimizes the potential for direct exposure to contaminated soil by human receptors.
- The groundwater at Zone 4 is not currently or anticipated to be used in the future as a potable water source because it is brackish (classified as GB); therefore, there is no imminent threat to human health.
- The storm sewer system in Zone 4 is a potential a migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Seven catch basins in Zone 4 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

Zone 4 proceeded to an FS to evaluate appropriate remedial alternatives for the soil and groundwater. The FS is currently being prepared and the Navy is resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 4 will be selected after the FS is finalized.

#### 16.3 REMEDIAL ACTIONS

## 16.3.1 Remedy Selection

A final remedy has not been selected or implemented at Zone 4, which includes Site 19. An FS is currently being prepared to evaluate alternatives for the zone. The Lower Subase RI recommended that the FS for Zone 4 evaluate a range of remedial alternatives that include institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives.

## 16.3.2 <u>Remedy Implementation</u>

A final remedy has not yet been chosen for Zone 4. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

#### 16.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 19. The recommendations from the First Five-Year Review Report are provided below along with the actions taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 4 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it is recommended that there be enforcement of the IR Site Use Restriction instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information from Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 19.

#### 16.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

## 16.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 19. Within the past 5 years, no other documents have been completed regarding this site.

## 16.5.2 Data Review

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

#### 16.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 4; therefore, ARARs and sitespecific action levels have not been identified for Zone 4.

#### 16.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 4 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. It was noted during the site inspection that Building 80 in Zone 4 was demolished within the past 5 years. No other issues were identified and no photos of the zone were taken during the inspection. The Navy has no plans to change the current use of the site.

#### 16.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

## 16.6 ASSESSMENT

Because a final remedy has not been selected for Zone 4, conclusions cannot be made to support the determination that the remedy at Zone 4 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under the current land use scenario.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR Sites.

#### **16.7 ISSUES**

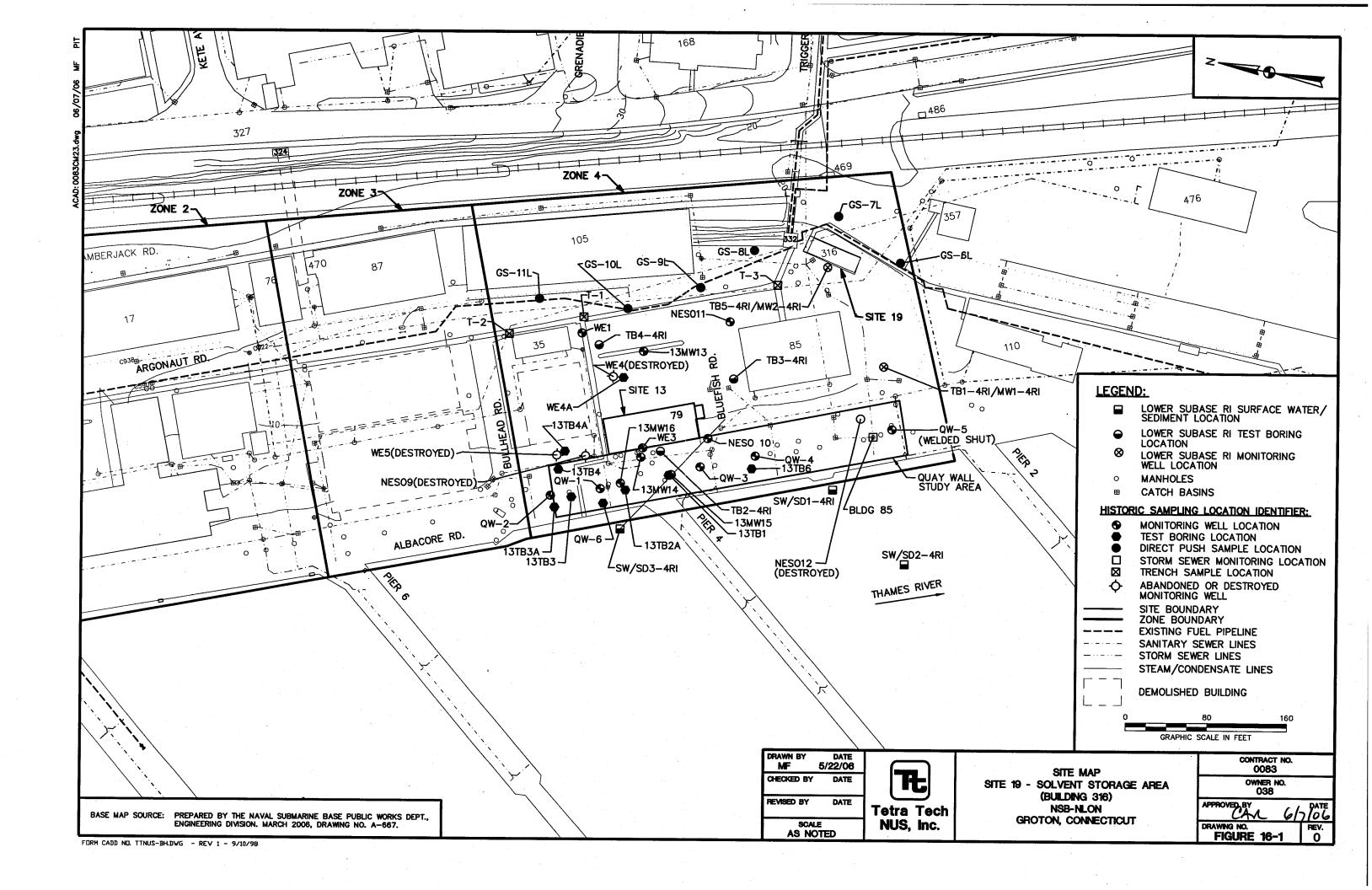
A final remedy has not been implemented at Zone 4; therefore, deficiencies cannot be determined at this time.

#### 16.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the recommended remedial action for Zone 4 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be enforcement of the IR Site Use Restriction Instruction.

#### 16.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 4, which includes Site 19, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



## 17.0 SITE 20 - AREA A WEAPONS CENTER (OU7 AND OU9)

This five-year review is being conducted for Site 13 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 20 was investigated during the Phase I RI (Atlantic, 1992), Phase II RI (B&RE, 1997a), BGOURI (TtNUS, 2002a), and BGOURI DGI (TtNUS, 2002e). The results of the investigations showed minimal contamination of groundwater and surface water at the site, but the soil at the site may be a contaminant source to the Area A Wetlands. A remedial alternative of excavation and off-site disposal was subsequently selected in the ROD for the soil and sediment OU (OU7) at Site 20 (Navy, 2000a). The remedial action consisted of the removal of a small amount of PAH- and arsenic-contaminated soil and sediment (less than 200 cubic yards) and was completed in 2001. An NFA remedy was selected for Site 20 groundwater, a portion of OU9, in an Interim ROD (Navy, 2000h). It is expected that NFA will be the final remedy for Site 20 groundwater after remedial actions are selected for all portions of OU9.

#### 17.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 20 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Storage of chemicals and chemical wastes generated by Building 524. Weapons storage in bunkers.	Current
Phase II RI Report recommended an FS for Site 20.	1997
Proposed Plan for Soil and Sediment published.	May 2000
Final FS for Site 20 Soil and Sediment completed.	June 2000
ROD for Soil and Sediment signed.	June 2000
Remedial Action for Soil and Sediment completed.	2001
First Five-Year Review performed.	December 2001
BGOURI completed.	January 2002
BGOURI Update/FS completed.	July 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9) completed.	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater signed.	December 2004

## 17.2 BACKGROUND

Site 20 is the Area A Weapons Center, which is located north of the terminus of Triton Avenue, adjacent to the Area A Wetland. The site map is included as Figure 17-1. The site's location relative to other IR sites is shown on Figure 1-2. The site includes Building 524 and the north and south weapons storage areas. Building 524 is used for administration, minor torpedo assembly, and storage of simulator torpedoes (B&RE, 1997a). No weapons production takes place in this building. Chemicals and chemical wastes, including cleaning and lubricating compounds, paints, adhesives, and liquid fuels, were stored in 1-gallon to 5-gallon containers in seven metal storage cabinets located on a paved area south of the building (B&RE, 1997a). Many of these materials are classified as corrosive or flammable. Building 524 was constructed in 1990/1991. Prior to construction, the area was primarily woodlands. Portions of the site were blasted to remove bedrock during construction.

The north and south weapons storage bunkers are located southeast of Building 524. The southern bunkers are first evident in photographs from 1969, and the northern area bunker is evident in photographs from 1974. Weapons containing liquid fuels such as Otto fuel, JP-10, and TH Dimer (jet rocket fuel) are stored in these bunkers (B&RE, 1997a). Routine maintenance and security improvements were planned for the Area A Weapons Center include grouting and waterproofing of bunkers, repaving of roads, regrading, and culvert installation and it is assumed that they were completed.

Site 20 was investigated during the Phase II RI (B&RE, 1997a). Minimal contamination of surface water and groundwater was detected, and the potential for substantial contaminant transport was determined to be low. Therefore, limited action was recommended for the site in the Phase II RI. No impacted soil or sediment was identified at Building 524 at Site 20, and a remedial action in the area was not recommended.

A ROD was signed for the soil and sediment OU associated with Site 20 (OU7) in June 2000 (Navy, 2000a). A small (less than 200 cubic yards) remedial action was conducted at the site in 2001 to address PAH and arsenic contamination in soil and sediment. The action was intended to mitigate direct exposures to soil and sediment and involved the excavation of soil and sediment with contaminant concentrations exceeding cleanup levels. Confirmatory soil and sediment samples were collected from the bottom and sidewalls of the excavation. Following verification of contaminated soil removal, the excavations were backfilled with clean soil, the drainage swales were regraded, and the disturbed asphalt was replaced.

The groundwater at Site 20 was further characterized during the BGOURI (TtNUS, 2002a). The objectives of the investigation were to further characterize the nature and extent of groundwater

contamination and to quantify the risks to human receptors from the groundwater. In general, organic and inorganic contaminants were detected infrequently and at low concentrations in groundwater at Site 20. TCE and benzo(a)pyrene were the only organic contaminants identified as significant contaminants in groundwater. Metals detected at significant concentrations in groundwater included antimony, arsenic, nickel, silver, thallium, and zinc. High levels of TSS and TDS in one sample may have caused the elevated concentrations of two of the metals. All organic and inorganic contaminants were identified in samples from overburden monitoring wells.

The HHRA determined that risks posed by exposure of construction workers to maximum observed concentrations of site contaminants in groundwater at Site 20 are less than acceptable levels. The HHRA also evaluated future residential groundwater usage, and calculated risks were greater than acceptable levels based on exposure to maximum contaminant concentrations. Even though contaminant concentrations were generally low and risks were acceptable under the current land use scenario, the RI recommended that an FS be prepared for groundwater associated with Site 20.

Prior to proceeding to an FS for groundwater, a DGI was conducted at Site 20 to confirm the groundwater results of the BGOURI. The results of the DGI were presented in the BGOURI Update/FS (TtNUS, 2004). During the DGI, groundwater samples were collected from the two monitoring wells in which elevated silver concentrations were detected during the BGOURI. The groundwater samples were analyzed for total and dissolved TAL inorganics. Silver was not detected at concentrations greater than the detection limit (4.8 µg/L) in either well during the DGI. These results, in conjunction with similar nondetect results during the Phase II RI, indicated that the silver concentrations detected during the BGOURI were anomalies. Further data and risk evaluations were also conducted during the BGOURI Update. The results of the evaluations indicated no significant contamination in Site 20 groundwater and no significant risks to human health associated with exposure to Site 20 groundwater. The BGOURI Update recommended that an FS not be prepared for Site 20 groundwater and that an NFA decision document be prepared for the groundwater. The Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 groundwater (OU9) at NSB-NLON was released for public comment on September 24, 2004 (Navy, 2004d). The Interim ROD for OU9 was signed in December 2004, which called for NFA for Site 20 groundwater (Navy, 2004h).

#### 17.3 REMEDIAL ACTIONS

### 17.3.1 Remedy Selection

The ROD for Site 20 soil and sediment was signed in June 2000. The RAOs developed to aid in the development of alternatives were as follows:

- Minimize potential human exposure to COCs above cleanup levels that will ensure that carcinogenic risk levels do not exceed 1x10<sup>-5</sup> and noncarcinogenic risks do not exceed an HI of 1.0.
- Minimize the potential migration of COCs from soil into groundwater.
- Minimize potential transport of COCs from Site 20 into the Area A Wetlands or the Area A Downstream Watercourses.

The selected remedy for soil and sediment at Site 20 was excavation with asphalt batching or off-site disposal (residential scenario). The selected remedy addresses principal and low-level wastes in soil and sediment, including PAHs and inorganic constituents. The major components of the selected remedy were as follows:

- Excavation of all soil and sediment containing PAHs and metals in excess of medium-specific residential cleanup goals.
- Off-site asphalt batching (treatment using thermoplastic stabilization/solidification) of excavated media or disposal at an off-site, licensed disposal facility if asphalt batching is not available in the State of Connecticut at the time of excavation.
- Collection of confirmatory samples from the bottom and sidewalls of the excavation to confirm that material exceeding the medium-specific cleanup levels has been removed.

The remedial goals for the remedial action are summarized below.

Constituent of Concern	Cleanup Level	Basis of Cleanup Level
SOIL		•
Arsenic	9.62 mg/kg	Risk Assessment
Benzo(a)anthracene	1.0 mg/kg	CTDEP RSR
Benzo(a)pyrene	1.0 mg/kg	CTDEP RSR
Benzo(b)fluoranthene	1.0 mg/kg	CTDEP RSR
Chrysene	1.0 mg/kg	CTDEP RSR
Dibenzo(a,h)anthracene	1.0 mg/kg	CTDEP RSR
SEDIMENT		•
Arsenic	19.27 mg/kg	Risk Assessment
Benzo(a)pyrene	4.08 mg/kg	Risk Assessment
Dibenzo(a,h)anthracene	4.08 mg/kg	Risk Assessment

Groundwater at Site 20 was addressed as part of the BGOURI and BGOURI Update/FS. The overburden and bedrock groundwater at Site 20 was characterized during three separate investigations. VOCs and SVOCs were detected sporadically at low concentrations in overburden and bedrock groundwater during the investigations. Naturally occurring metals were detected consistently in the groundwater. The Interim ROD for OU9 (Navy, 2004h) recommended NFA for Site 20 groundwater.

## 17.3.2 Remedy Implementation

#### **Soil and Sediment**

A Remedial Design Work Plan for soil and sediment at Site 20 was completed by Foster Wheeler for the Navy. The sequence of actions regarding Site 20 soil and sediment contamination was as follows:

- Excavated soil and sediment that contained COCs at concentrations exceeding the clean-up levels.
- Soil and sediment was removed from Drainage Area 1. Soil and sediments in Drainage Areas 2 and 3 were less than cleanup levels and did not require remediation. These areas were sampled to ensure that all soil and sediment concentrations at the Area A Weapons Center were less than remedial goals.
- The affected soil and sediment was temporarily stockpiled on site.
- Confirmatory soil and sediment samples were collected from the bottom and sidewalls of the excavation and sent to a laboratory for PAHs and inorganic analyses to confirm that material exceeding the medium-specific cleanup levels was removed. At least 5 samples were collected at each excavation location (one from the bottom and each sidewall of the excavation) and one sample was taken every 10 feet along the drainage swale. In addition, one sample per 100 cubic yards of excavated material was collected for waste characterization.
- The excavated area was backfilled with clean soil, the drainage swales were regraded, and disturbed asphalt was replaced.
- Asphalt batching was the preferred disposal option and the excavated soil was to be treated using thermoplastic stabilization/solidification (e.g., asphalt batching). However, asphalt batching was not available and the excavated soil was disposed at an off-site, licensed disposal facility.
- Safety precautions were taken during excavation, loading, and transporting activities to minimize fugitive dust emissions.

The remedial action involved excavation and disposal of less than 200 cubic yards of soil and sediment and it was conducted in 2001 (FWEC, 2002b). The contaminated soil and sediment was disposed in the BFI Landfill in Fall River, Massachusetts. Asphalt removed during the remedial action was shipped to Aggregate Industries in Stoughton, Massachusetts for recycling. The total cost for the remedial action was \$149,250.

#### Groundwater

The selected remedy for Site 20 groundwater was NFA; therefore, remedy implementation is not a concern.

## 17.3.3 System Operations/O&M

O&M is not required for Site 20 because contaminated soil and sediment with contaminant concentrations greater than the remedial goals were removed from the site, and the selected remedy for groundwater was NFA.

#### 17.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 20. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It is recommended that the remedial action for the soil and sediment be completed at Site 20 and that an FS be completed to determine the necessary actions for groundwater at Site 20. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

- The remedial action for soil and sediment was completed in October 2001. Approximately 200 cubic yards of contaminated soil and sediment were excavated and disposed off site.
- Site 20 groundwater was evaluated in the BGOURI Update/FS (TtNUS, 2004). The BGOURI Update
  recommended an FS not be prepared for Site 20 groundwater and that an NFA decision document be
  prepared for groundwater. The Interim ROD was signed in December 2004, and the selected remedy
  for Site 20 groundwater was NFA.

Also, it is recommended that there be enforcement of the IR Site Use Restriction Instruction.

 The instruction was enforced at Site 20 until the remedial action for soil and sediment was completed and the groundwater ROD was signed in 2004. Because there are no hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure, enforcement of the instruction is no longer necessary at Site 20.

#### 17.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 17.5.1 Document Review

The following documents were reviewed for the second five-year review:

BGOURI	January 2002
Final Remedial Action Report	June 2002
BGOURI Update/FS	July 2004
Proposed Plan for Sites 3, 7, 14, 15, 18, and 20 Groundwater (OU9)	September 2004
Interim ROD for Sites 3, 7, 14, 15, 18, and 20 Groundwater	December 2004

#### 17.5.2 Data Review

No monitoring or O&M is necessary at this site; therefore, there were no data available for review.

## 17.5.3 ARAR and Site-Specific Action Level Changes

No new human health or ecological ARARs have been promulgated that would call into question the protectiveness of the remedies selected for the soil, sediment, and groundwater.

## 17.5.4 Site Inspection and Site Interviews

Because soil and sediment with contaminant concentrations exceeding cleanup levels were removed and the selected remedy for groundwater is NFA, no site inspection or site interviews were performed. Future land use at Site 20 is likely to remain the same. The site is located in a high-security area at NSB-NLON.

## 17.6 ASSESSMENT

The following conclusions support the determination that the remedies selected for Site 20 are currently protective of human health and the environment.

## Question 1. Is the remedy functioning as intended by the decision documents?

Soil and sediment with contaminant concentrations exceeding cleanup levels were removed during the remedial action. The selected remedy for groundwater was NFA.

Question 2. Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

- Changes in Standards and TBCs: ARARs and TBCs considered during preparation of the RODs were reviewed, and there have been no changes that would impact the selected remedies.
- Changes in Exposure Pathways: There have been no changes at the site that would have resulted
  in new exposure pathways to human or ecological receptors.
- Changes in Toxicity and Other Contaminant Characteristics: There have been no changes in human health toxicity criteria that would impact the selected remedies.
- Changes in Risk Assessment Methods: As discussed in Section 1.4, there have been no major changes in HHRA methodology since the signing of the RODs that would impact the protectiveness of the remedies.
- Expected Progress Towards Meeting RAOs: The RAOs for Site 20 soil (OU7) were met by
  excavating and disposing of contaminated soil and sediment with concentrations in excess of the
  remedial goals at an approved disposal facility. The remedy selected for Site 20 groundwater, a
  portion of OU9, was NFA; therefore, RAOs were not required.

## Question 3. Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedies.

## 17.7 ISSUES

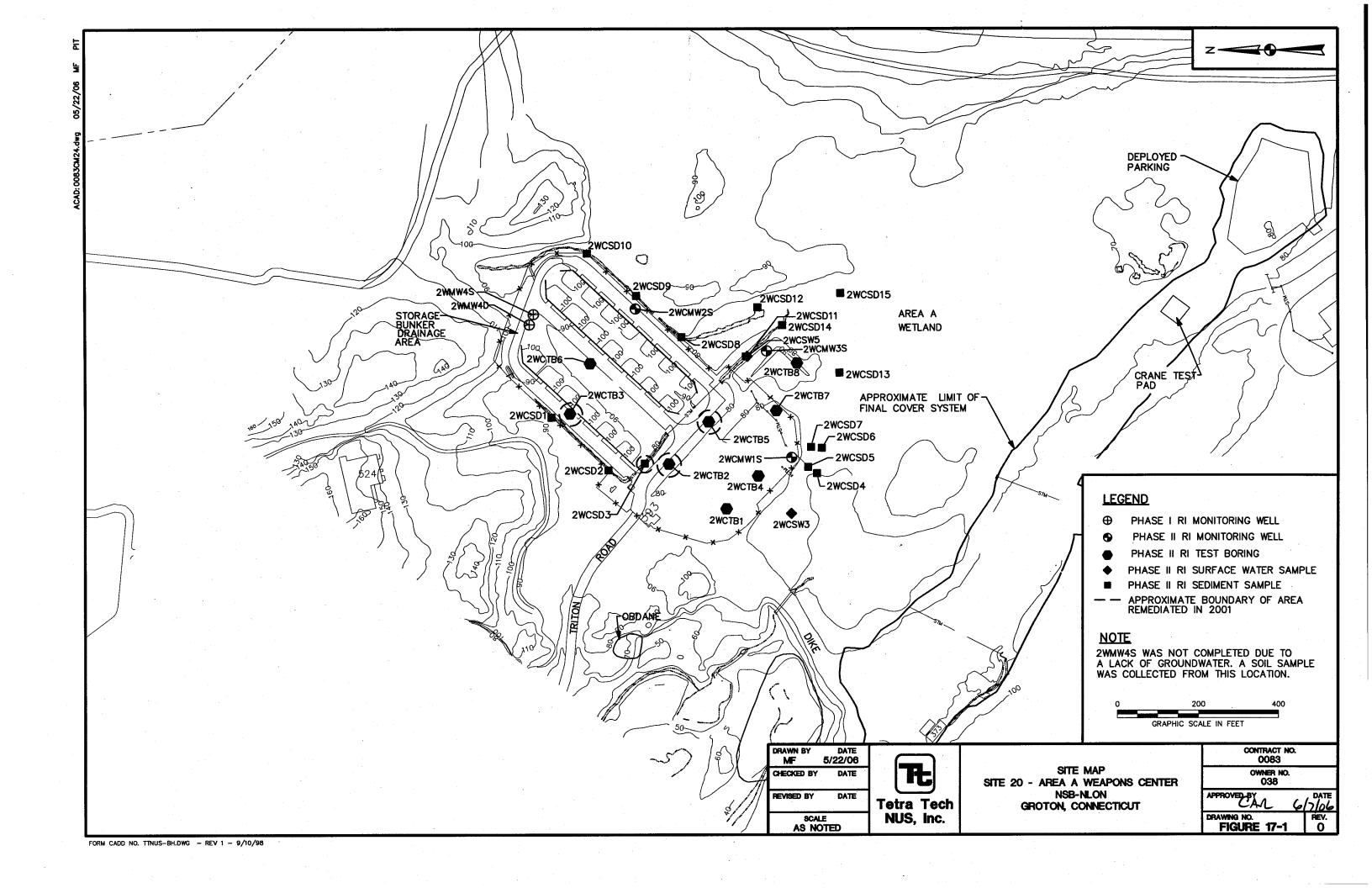
The Site 20 monitoring wells have not been properly abandoned. Because no additional sampling is required from the wells, the wells should be properly abandoned.

## 17.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that no additional five-year reviews of Site 20 be completed because the remedies implemented at the site did not result in hazardous substances, pollutants, or contaminants remaining on site in excess of levels that allow for unlimited use and unrestricted exposure. It is also recommended that a well abandonment program be developed and implemented to properly abandon Site 20 monitoring wells.

## 17.9 PROTECTIVENESS STATEMENT

The remedies for Site 20 are protective of human health and the environment because all contaminated soil and sediment with concentrations greater than the remedial goals were removed from the site, and there are no unacceptable risks from exposure to groundwater.



## 18.0 SITE 21 - LOWER SUBASE - BERTH 16 (OU4)

This five-year review is being conducted for Site 21 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 21 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

## 18.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 21 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Construction of Buildings 103, 173, 106, and 156.	1918 – 1944
Construction of Buildings 456 and 478.	After 1979
Final Site Inspection Report for Berth 16 completed.	1995
Final Lower Subase RI completed.	1999
First Five-Year Review completed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

#### 18.2 BACKGROUND

Site 21 is Berth 16, which is located at the Lower Subase along the Thames River at the intersection of Amberjack Road and Albacore Road. The site map is included as Figure 18-1. Figure 1-2 shows the location of the site relative to the other IR sites at NSB-NLON. The following structures are currently included in Berth 16 (Atlantic, 1995a).

Building	Original Use	Current Use
103	Instruction	Instruction
173	Substation	Electrical distribution
106	Photolab and electronics	Storage
157	Periscope Shop	Optical Shop
456,478	Maintenance Shop	Maintenance Shop

Berth 16 formerly included a refuse/classified materials incinerator; an underground, 250-gallon, diesel fuel storage tank; and an underground, diesel-fuel transfer line (Atlantic, 1995a). The incinerator, which

was located at the current site of Building 478, has been separated from Site 21 and is now Site 25. The UST was located adjacent to the northern wall of Building 157, and the underground fuel line extended along Pier 51, east of Building 173. All these items have been decommissioned (Atlantic, 1995a). Sites 21 and 25 were evaluated collectively as Zone 7 during the Lower Subase RI. Because of this approach, the remainder of this section discusses information in terms of Zone 7.

Soil, groundwater, and sediment sampling (in the adjacent Thames River) and analysis were conducted at the site in conjunction with the Lower Subase RI (TtNUS, 1999b). The Lower Subase RI (TtNUS, 1999b) recommended that Zone 7 proceed to an FS to evaluate appropriate remedial alternatives for the soil and groundwater OU. These recommendations were based on the following information:

- The nature and extent of organic and inorganic contamination in soil are well defined to the extent practical considering the limitations presented by existing infrastructure.
- The baseline HHRA indicated that ILCRs for full-time employees and hypothetical future residents under the RME scenario are in excess of the USEPA acceptable risk range and the CTDEP cumulative target cancer risk level. Noncarcinogenic risks for all receptor groups were less than the USEPA and CTDEP acceptable limit of 1.0, except for the construction worker under the RME scenario. Although the RME HI for the construction worker slightly exceeded unity, adverse impacts are not anticipated because the major contributors (antimony and manganese) to the cumulative risk do not affect the same target organs. Cumulative risks to each individual target organ are expected to be less than unity. In addition, modeling performed to evaluate exposure to lead showed that all receptors (i.e., small children, fetuses of pregnant women, future employees, and construction workers) are at risk in Zone 7. These elevated risks (for lead and other chemicals) assume that, sometime in the future, soils currently covered by pavement or buildings would be exposed and available for human contact.
- Evidence suggests that inorganic contamination (mainly lead) is migrating from soil to groundwater.
- Natural attenuation or bioremediation could be feasible alternatives for petroleum contamination in soil.
- The Navy decommissioned the fuel lines within Zone 7; therefore, the historic source of petroleum contamination has been eliminated.
- The zone is covered with pavement or buildings, which minimizes direct exposure of human receptors to contaminated soil.

- The data do not suggest that petroleum contamination in soil is significantly migrating to groundwater. In addition, natural attenuation processes seem to be at work in the groundwater. These processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Groundwater monitoring will confirm this information.
- A tiered groundwater monitoring program will allow for further actions to be completed if results show significant adverse impacts.
- The source of lead contamination in the groundwater is the unsaturated soil of Zone 7. Appropriate remedial alternatives for Zone 7 soil will be evaluated in the FS. When the appropriate actions are taken, concentrations of lead in groundwater will decrease.
- The ERA for the Thames River adjacent to Zone 7 shows that maximum concentrations of several non-AVS inorganics in Zone 7 sediments near the Lower Subase exceeded conservative guidelines (e.g., ER-Ls), indicating that potential risks may be present. The AVS/SEM analysis suggests that cadmium, copper, nickel, lead, and zinc are not bioavailable. Beryllium, cobalt, and vanadium were retained as COCs because no conservative sediment guidelines were available. No alternate guideline was available for barium, for which the maximum detected concentration exceeded the conservative guideline. The COCs were concluded to not be of ecological significance in the NSB-NLON Phase II RI ERA for the Thames River. Benzo(a)pyrene was the only organic in Zone 7 sediments that had maximum and average concentrations in excess of guidelines. HQ values were low, 1.39 for the maximum concentration and 1.11 for the average concentration. The maximum concentration of benzo(a)pyrene was much less than its ER-M. Significant toxicity was not observed in Zone 7 sediment toxicity tests from the NSB-NLON Phase II RI using Leptocheirus. Survival of Ampelisca was significantly lower than survival in reference sediments. Significant mortality was not observed in Pier 17 EA toxicity tests with Ampelisca. The Pier 17 EA benthic community analyses concluded that the Pier 15 benthic community was relatively healthy, and the Pier 17 benthic community appeared to be disturbed. Significant bioaccumulation of some PAHs was observed in Pier 17 EA bioaccumulation studies with Macoma and Nereis. Some bioaccumulation of PCBs was noted in Nereis but not in Macoma. Significant bioaccumulation of inorganics was not observed in either species. Low concentrations of some inorganics and pesticides were detected in a blue mussel sample collected in Zone 7. The weight of evidence appears to be equivocal, suggesting significant potential risks to sediment-dwelling organisms from contaminants in Zone 7 near Pier 17 but not near Pier 15. However, most of the Pier 15 and Pier 17 sediments have been subsequently dredged, making interpretation of biological analyses from historical studies difficult. Sediments were

replaced with "clean" fill after dredging, which may have ameliorated some of the potential risks. The NSB-NLON Phase II RI suggested that potential risk in the Lower Subase was confined to the Piers 15 and 17 area.

- The groundwater at Zone 7 is not currently or anticipated to be used in the future as a potable water source because it is brackish (classified GB); therefore, there is no imminent threat to human health.
- The Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 7.
- The storm sewer system in Zone 7 is a potential migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Five catch basins in Zone 7 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

An FS is currently being prepared for Zone 7 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 7 will be selected after the FS is finalized.

#### 18.3 REMEDIAL ACTIONS

## 18.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 7. An FS is currently being prepared to evaluate alternatives for the zone. The Lower Subase RI recommended that the FS for Zone 7 evaluate appropriate remedial alternatives for the soil including institutional controls, passive and/or in-situ technologies, and hot spot removal actions for the lead contamination. In addition, it was recommended that the FS evaluate limited action scenarios for the groundwater of Zone 7.

## 18.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 7. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

#### 18.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of Site 21. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 7 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

Also, it was recommended that rehabilitation or abandonment of site groundwater monitoring wells be conducted.

No rehabilitation or abandonment activities have been performed on Site 21 groundwater monitoring
wells since the first five-year review. Monitoring wells are still present at the site with missing covers,
providing an open conduit from the ground surface to the groundwater aquifer.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 21.

#### 18.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the 5-year review process and the actions taken to complete this review.

#### 18.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 21. Within the past 5 years, no other documents have been completed regarding this site.

## 18.5.2 Data Review

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

## 18.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 7; therefore, ARARs and sitespecific action levels have not been identified for Zone 7.

## 18.5.4 <u>Site Inspection</u>

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 7 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. It was noted during the site inspection that an extension to Building 157 (Zone 7) was being built. Excavated soil from near Building 157 had been stockpiled, and samples from the stockpile had been tested for TCLP lead and had failed. The soil was to be disposed at an approved off-site disposal facility. No photos of the zone were taken during the inspection. The Navy has no additional plans to change the current use of the site.

## 18.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

#### 18.6 ASSESSMENT

Because a final remedy has not been selected for Zone 7, conclusions cannot be made to support the determination that the remedy at Zone 7 is protective of human health and the environment. The results of the Lower Subase RI do no indicate any imminent threats to human health or the environment as long as site conditions remain the same.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and subsurface disturbance of soils and/or groundwater at IR sites.

## 18.7 ISSUES

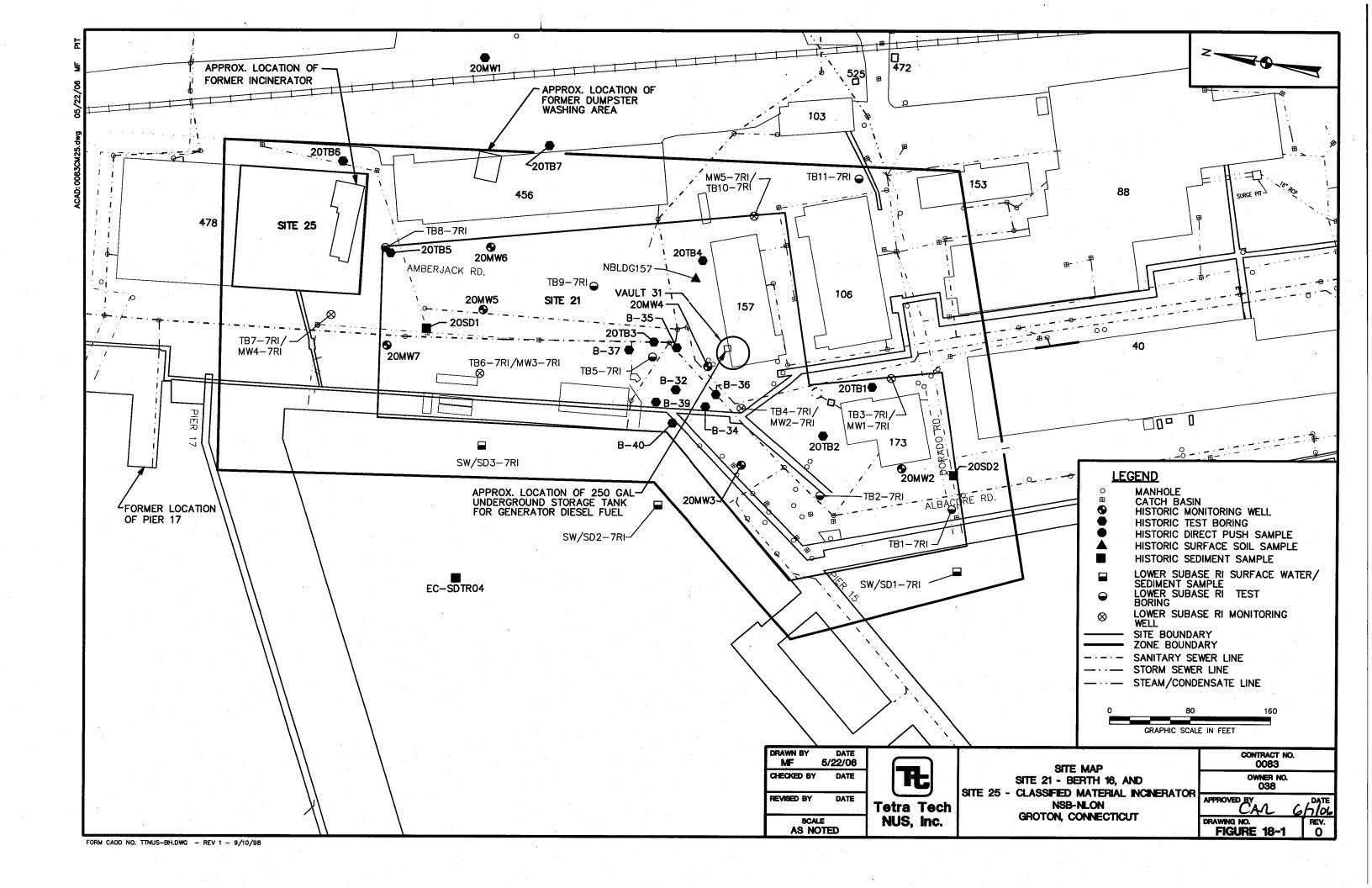
A final remedy has not been implemented at Zone 7; therefore, deficiencies in the remedial action cannot be determined at this time. However, during the first five-year review site inspection, it was noted that several site monitoring wells were missing covers, providing an open conduit from the ground surface to groundwater. It was recommended that these wells be rehabilitated or abandoned; however, no action has been taken to correct the problem.

#### 18.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 7 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. In addition, it is recommended that rehabilitation or abandonment of site groundwater monitoring wells be conducted. Also, it is recommended that there be enforcement of the IR Site Use Restriction Instruction.

#### 18.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 7, which includes Site 21, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



## 19.0 SITE 22 - LOWER SUBASE - PIER 33 (OU4)

This five-year review is being conducted for Site 22 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 22 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 19.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 22 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Final Site Inspection Report, Pier 33 and Berth 16 completed.	1995
Final Lower Subase RI Report completed.	1999
First Five-Year Review completed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

## 19.2 BACKGROUND

Site 22 is located at the Lower Subase along the Thames River and includes Pier 33, Building 175, and approximately 800 feet of property in the area of Pier 33, Building 175, and Amberjack Road. The site map is included as Figure 19-1. The site's location relative to other IR sites is shown on Figure 1-2.

Building 175 was originally used to house several above-ground battery acid storage tanks, which completely filled the building. Transfer lines from the battery acid storage tanks extended along Amberjack Road in trenches to the piers (Atlantic, 1995a). These storage tanks and the associated transfer piping have been removed. There are no known or reported spills from the storage tanks or transfer system. Building 175 is currently used for miscellaneous storage and administrative purposes. No underground steam or fuel-oil utilities service Building 175.

A 1,000-gallon, underground fuel storage tank was located adjacent to the southern side of Building 175. The age and type of the tank are unknown. Based on a tank test performed on May 22, 1990, no leakage was identified. Stained soil was observed around the fill pipe of the UST, and concentrations of TPH detected in shallow and deep soil samples collected in the vicinity of the UST exceeded State and federal

criteria (Atlantic, 1995a). This information indicated that the UST was the source of the TPH contamination. The tank has since been excavated, removed, and replaced by a new 1,000-gallon UST. A 250-gallon, underground diesel fuel storage tank is located adjacent to the northern side of Building 175 and this tank services an emergency generator for the sewage lift station. The age and type of the tank are unknown.

Zone 5 consists of Site 22 and was investigated during the Pier 33 and Berth 16/Former Incinerator Site Investigation (Atlantic, 1995a) and the Lower Subase RI (TtNUS, 1999b). No. 2 fuel oil was detected in subsurface soils in front of Building 175 during the 1995 Site Investigation. Additional investigation of site operations and sediment analysis of the storm sewer system were recommended to determine the extent and source of sediment contamination. Removal and disposal of contaminated sediment and modification of any site operations identified as a contributor to the contaminated sediment were also recommended.

Additional soil, groundwater, and sediment sampling (in the adjacent Thames River) were conducted at this zone in conjunction with the Lower Subase RI. The Lower Subase RI Report (TtNUS, 1999b) recommended that Zone 5 proceed to an FS to evaluate appropriate remedial alternatives. Because of the extensive amount of underground utilities in Zone 5 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus to the extent possible on alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives. A "hot spot" removal action for petroleum contamination in the soil of Zone 5 should also be included in one of the alternatives evaluated during the FS. It was also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 5, in conjunction with the soil remedial alternatives. A combination of monitored natural attenuation and a tiered groundwater monitoring program should be evaluated for groundwater. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in the soil and groundwater are well
  defined to the extent practical considering limitations presented by existing infrastructure.
- The contamination detected at Zone 5 is related to the former UST used to store heating oil and not to the battery acid above-ground storage tanks (ASTs) that were in Building 175. The UST has been replaced; therefore, the main source of the contamination has been eliminated.
- Monitored natural attenuation or bioremediation could be feasible alternatives for petroleum contamination in soil.

- Evidence suggests that limited organic contamination may be migrating from the site. Natural attenuation processes seem to be at work in the groundwater. These processes can reduce concentrations of petroleum contamination that reach the aquifer and convert the petroleum contamination to a less toxic form. Monitored natural attenuation should be further evaluated as part of the remedial strategy for Zone 5 to confirm the effectiveness of these processes. The monitored natural attenuation program should include or be part of a tiered groundwater monitoring program, similar to those currently being implemented at other NSB-NLON IRP sites. These programs confirm or disprove that contamination present in the soil is mobile and impacting other media and allow for further actions to be completed if the results show significant impacts.
- The baseline HHRA indicates that there are minimal risks to human receptors. None of the risks
  were in excess of the USEPA acceptable risk range, but the risk to the hypothetical future resident
  under the RME scenario slightly exceeded the CTDEP risk level. Lead was not a COC for this zone;
  therefore, modeling was not necessary to evaluate exposure to lead.
- Although reported concentrations of TPH in site soil samples exceeded the State RSRs for direct
  exposure and pollutant mobility, the chemical-specific risk assessment for the compounds assumed
  to be the major constituents of the observed TPH contamination indicated minimal risks to potential
  human receptors.
- The zone is generally covered with pavement and a building, which minimizes direct exposure to the contaminated soil by human receptors.
- Elevated levels of inorganics, particularly lead, were detected in sediment collected from a catch basin between Zones 5 and 6. Both zones contribute surface water to this catch basin. Slightly elevated levels of inorganics were also detected in surface water samples collected from the storm sewer system for the National Pollution Discharge Elimination System (NPDES) permit. Therefore, the storm sewer system in Zone 5 may be acting as a migration pathway for inorganic contaminants. The lead contamination is believed to be the result of storage of lead ballast in this area and surface water runoff. The Navy has eliminated the storage of ballast in this area.
- The storm sewer system in Zone 5 is a potential migration pathway for contaminants present in groundwater.
- The ERA for the Thames River adjacent to Zone 5 shows that risks to ecological receptors in this
  area are relatively low.

- The groundwater at Zone 5 is not currently or anticipated to be used in the future as a potable water source because it is brackish; therefore, there is no imminent threat to human health.
- The Thames River provides significant dilution and mixing, which minimize the impact of contaminant migration from Zone 5.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two catch basins in Zone 5 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

A FS is currently being prepared for Zone 5 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 5 will be selected after the FS is finalized.

#### 19.3 REMEDIAL ACTIONS

#### 19.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 5. An FS is currently being prepared to evaluate alternatives for the zone. The Lower Subase RI (TtNUS, 1999b) recommended that the FS for Zone 5, which includes Site 22, focus, to the extent possible, on alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives.

## 19.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 5. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

#### 19.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 22. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 5 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction Instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Navy, 2003). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 22.

#### 19.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

## 19.5.1 <u>Document Review</u>

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 22. Within the past 5 years, no other documents have been completed regarding this site.

## 19.5.2 <u>Data Review</u>

No new data was collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

#### 19.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 5; therefore, ARARs and sitespecific action levels have not been identified for Zone 5.

### 19.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 5 consists of Pier 33, Building 175, and approximately 400 linear feet of additional river front property adjacent to these two structures. The area is covered with pavement or buildings and is adjacent to the Thames River and railroad. The Lower Subase is a high-security area at NSB-NLON and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. No issues were identified during the inspection, and no photos of the zone were taken during the inspection. The Navy has no additional plans to change the current use of the site.

#### 19.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second five-year review.

#### 19.6 ASSESSMENT

Because a final remedy has not been implemented at Zone 5, conclusions cannot be made to support the determination that the remedy at Zone 5 is protective of human health and the environment. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under the current land use scenario.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. This policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

#### 19.7 ISSUES

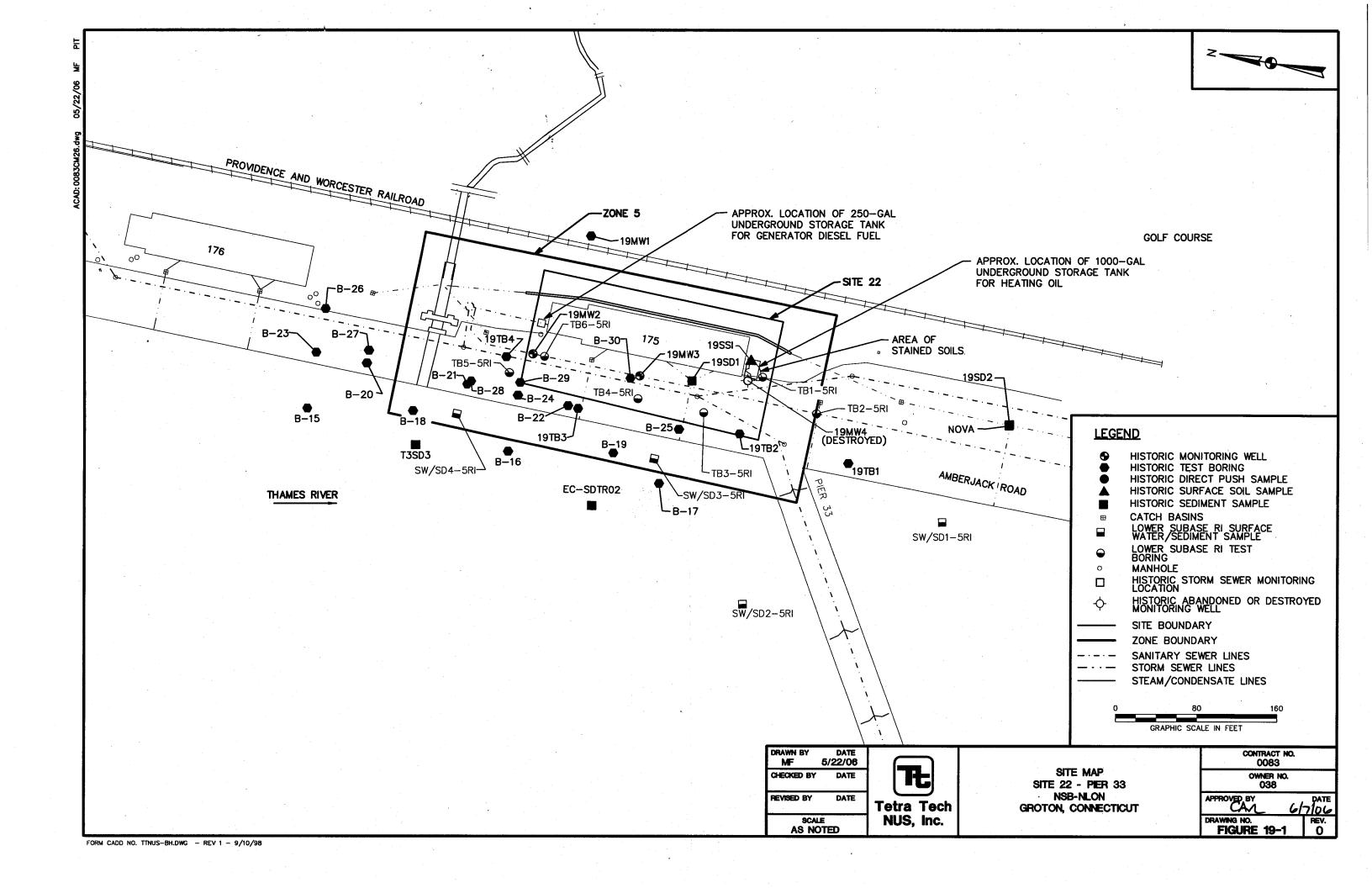
A final remedy has not been selected for Zone 5; therefore, deficiencies cannot be determined at this time.

#### 19.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 5 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be continued enforcement of the IR Site Use Restriction Instruction.

# 19.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 5, which includes Site 22, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI (TtNUS, 1999b) do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



# **20.0 SITE 23 – TANK FARM (OU9)**

This five-year review is being conducted for Site 23 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. The soil at Site 23 was investigated and remediated under the CTDEP RCRA UST Program. As such, no decision documents were prepared for the soil OU. Groundwater associated with the site is being investigated under CERCLA, but no decision documents have been prepared for the groundwater OU (OU9).

#### 20.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 23 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Crystal Lake drained and dredged to allow for construction of nine concrete USTs.	1940s
Decommissioning and demolition of Tank OT-6.	1970s
Tanks OT-7 through OT-9 decommissioned.	1990
New Tank OT-10 installed and Tanks OT-4 and OT-5 decommissioned.	1990
Tanks OT-1 through OT-3 removed from service.	1991
Waste Oil Tank OT-5 investigated for demolition and closure.	1994
Site Investigation of Tank Farm completed to define extent of soil and groundwater contamination in the UST farm.	1997
Free-product removal and soil excavation completed at OT-8.	February 1998
Hydrogeologic study at the Tank Farm conducted to provide information to complete the design of a replacement storm sewer system.	1998
Tank Farm in the vicinity of OT-2 and OT-3 further investigated because weathered diesel fuel was detected in the storm sewers.	1999
Contaminated soil and free product remediated during storm drainage system rehabilitation by the Navy's RAC.	2000
First Five-Year Review completed.	December 2001
BGOURI completed.	January 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

### 20.2 BACKGROUND

In the early 1940s, Crystal Lake was drained and dredged to allow for construction of nine concrete USTs (see Figure 20-1). When construction was complete, the former lake bed was reportedly filled with soils excavated from a small hill west of the Tank Farm (Site 23) and graded to create a level surface for development at NSB-NLON. The location of Site 23 relative to the other IR sites is shown on Figure 1-2.

Each of the nine USTs had a holding capacity of 750,000 gallons. No. 6 fuel oil was stored in tanks OT-1 through OT-3 from the date of construction until they were removed from service in the summer of 1991. Tanks OT-7 through OT-9 were decommissioned in the summer of 1990 and were used exclusively for storage of diesel during all 48 years of service.

A reduced demand for diesel fuel at NSB-NLON in the mid-1970s led to the decommissioning and demolition of tank OT-6. The reduced demand for diesel also led to the modification of tank OT-5 for waste oil storage purposes. Tank OT-4 was used to store tank bottom wastes from OT-1. Tank OT-5 was used as part of an oil/water separator system. Tanks OT-4 and OT-5 were reportedly decommissioned after installation of a new 30,000-gallon waste oil underground tank (OT-10) in 1990. For further information regarding OT-5, see Section 9.0. Tanks OT-1 through OT-9 have been demolished and closed in place. Tank closure was accomplished following RCRA closure requirements by cleaning the tanks, demolishing the tank roof supports, and allowing the roof to collapse into the tank. The void was then filled with gravel, and the site was restored using soil and topsoil.

Evidence of releases of petroleum products from these tanks, their associated piping, and possibly from other nearby sources was detected during previous investigations. Historical sampling locations are shown on Figure 20-1. Both soil and groundwater contamination have been identified. Petroleum hydrocarbons have been detected periodically at the outfall of the Tank Farm storm sewer system. A number of petroleum releases were documented by the Navy in the vicinity of the Tank Farm at NSB-NLON from 1989 through 1999.

The Tank Farm features are shown on Figure 20-1 and include the following:

- Nine former 110-foot-diameter, 11-foot-high USTs (OT-1 to OT-9)
- A 30,000-gallon, double-walled UST (OT-10)
- An oil/water separator (at OT-10)
- A 10,000-gallon waste oil tank (at OT-10)
- A fuel oil loading area adjacent to Building 482
- Tanker truck dumping pad and trough (at OT-10)
- Associated UST piping systems

- The Morale, Welfare, and Recreation (MWR) Recreation Center (Building 461)
- · Baseball/softball fields
- A restroom facility (Building 445)
- Buildings that housed the former air sparging/soil vapor extraction (AS/SVE) facility for the Naval Exchange (NEX) service station
- Two 150,000-gallon diesel ASTs (OT-12 and OT-13)
- Miscellaneous buildings

### **Product Transfer Lines**

Product (No. 6 fuel oil or diesel fuel) was historically delivered via barge to a pier, where it was pumped via pipelines to the Tank Farm USTs through the Building 332 valve house. Product was transferred via pipeline from the USTs to the power plant or the submarines at the Lower Subase on an as-needed basis.

The No. 6 fuel oil transfer lines were situated within concrete-lined trenches but were removed because No. 6 fuel oil is no longer used at NSB-NLON. The diesel transfer lines have no trenches. Portions of the diesel fuel lines on the Lower Base were recently replaced. The lines located on the Upper Base are cathodically protected.

Petroleum contamination related to the former USTs and their associated piping was identified during previous investigations at Site 23. The Navy conducted three removal actions to address the identified contamination. Soil and free product were removed in the vicinity of OT-8 and OT-3 during the removal actions. Contaminated soil was also removed along Tang Avenue. In addition, BTEX compounds were historically detected in groundwater at the Tank Farm, and it was determined that the contamination was related to leaking USTs from an adjacent site (i.e., NEX Gas Station). The leaking USTs have been repaired, and an AS/SVE system was installed to address the associated BTEX plumes.

#### **Storm Drainage System**

The Tank Farm originally contained an extensive drainage system consisting of numerous catch basins, corrugated metal pipe, perforated corrugated metal pipe, vitrified clay pipe, and reinforced concrete pipe. According to NSB-NLON personnel, the drainage system served approximately one-third of the entire facility. Portions of the drainage system were installed with perforated corrugated metal pipe to depress the water table in the Tank Farm. The surface water and groundwater collected by the storm sewer system ultimately discharge to a boomed area of the Thames River, adjacent to the Goss Cove Landfill. Based on known elevations of storm sewer catch basins, the elevation of the drainage system is below the process piping.

The drainage system was rehabilitated in 2000. The original combined groundwater and stormwater system was separated into a deep groundwater and a new shallow stormwater system. The old deteriorated pipes in the groundwater collection system were slip-lined to improve their integrity and conductance. The old tank ring-drains (french drains) were not rehabilitated, but their connection with the groundwater collection system was maintained. Groundwater sampling and analysis from the groundwater collection system is currently ongoing, and the results will be used to determine if some form of further action is required for groundwater.

As part of the drainage system rehabilitation project, contaminated soil and free product were also remediated. Contaminated soil and free product, which were previously identified during the Tank Farm Site Investigation Addendum in the vicinity of the former UST OT-3, were removed and disposed off site. The Navy initiated a sampling program for the deep groundwater collection system after construction activities were completed. It was anticipated that the results would be used to determine whether further action is required for groundwater; however, a final decision has not been made yet.

### **Tank Underdrain System**

The nine former USTs (OT-1 to OT-9) at the Tank Farm were each rated for a nominal capacity of 750,000 gallons or approximately 100,000 cubic feet. Each tank was approximately 110 feet in diameter and 11 feet in depth. Depending on the season, the depth to groundwater in some areas of the site may be as little as 2 feet below grade. Groundwater at a depth of 2 feet would convert to a hydraulic pressure of 2.6 pounds per square inch exerted over the entire floor of one empty tank or an upward force of approximately 1,400 tons. The floor of the tank would rise, with or without its walls.

Tank stability was obtained using a combination of a site-wide drainage system, a series of columns inside the tanks, and an underdrain system. A site-wide stormwater drainage/dewatering system was installed, and french drains were installed around OT-1, OT-2, OT-3, OT-4, and OT-5. A series of 37 columns transmitted the weight of the tank roof and overlying fill to the floor of the tank.

#### **BGOURI**

The objectives of the BGOURI at Site 23 were to further characterize the nature and extent of groundwater contamination and to quantify the risks to human receptors from the groundwater. Groundwater sampling results for Site 23 indicated that the water quality is generally good, with only sporadic, low-concentration detections of VOCs, SVOCs, and metals in site monitoring wells. A preliminary evaluation of natural attenuation data indicated that biodegradation and other natural attenuation processes might be acting to reduce organic contaminants to relatively insignificant levels in

the Tank Farm. However, it was not recommended that a monitored natural attenuation alternative be pursued for the site.

The HHRA determined that risks posed by exposure of construction workers to groundwater at Site 23 are within USEPA and CTDEP acceptable levels, assuming that the workers are exposed to the maximum observed concentrations of site contaminants. Risks for hypothetical future adult residents exposed to groundwater at Site 23 were less than or within USEPA and CTDEP acceptable levels, assuming that the residents are exposed to the maximum observed concentrations of site contaminants. However, the chemical-specific ILCR for PCE exceeded CTDEP's target level for individual chemicals, although the maximum detected concentration for PCE was less than its CTDEP RSR. The Integrated Exposure Uptake Biokinetic (IEUBK) model indicated that no adverse effects are anticipated for hypothetical future child residents exposed to lead in groundwater at Site 23.

Based on the results of the risk assessment and the fact that groundwater at Site 23 is not used for human consumption and it is not likely to be used for human consumption in the foreseeable future because of its current classification (i.e., GB groundwater is not suitable for direct human consumption without treatment), it was recommended that the decision for preparation of an FS for the groundwater OU at the Tank Farm (a portion OU9) be postponed until site conditions stabilize and the results of the sampling and analysis program for the groundwater collection system determined the trends in groundwater contaminant concentrations.

### 20.3 REMEDIAL ACTIONS

#### 20.3.1 Remedy Selection

The soil at Site 23 was investigated and remediated under the CTDEP RCRA UST Program. The Navy conducted three removal actions to address the contamination identified in the soil. Soil and free product were removed in the vicinity of OT-8 and OT-3 during the removal actions. Contaminated soil was also removed along Tang Avenue. The remedial goal for the removal actions at OT-8 and Tang Avenue was 2,500 mg/kg for TPH. In addition, BTEX compounds were historically detected in groundwater in the Tank Farm, and it was determined that the contamination was related to leaking USTs from an adjacent site (NEX Gas Station). The leaking USTs were repaired, and an AS/SVE system was installed and operated to address the associated BTEX plumes.

A final remedy for Site 23 groundwater has not been selected or implemented. The BGOURI (TtNUS, 2002a) recommended evaluating the results of the sampling and analysis program for the groundwater collection system to determine if an FS or NFA ROD is required for the groundwater OU. The groundwater OU is currently proceeding through the CERCLA process.

#### 20.3.2 Remedy Implementation

The soil at Site 23 was investigated and remediated under the CTDEP RCRA UST Program. No additional information regarding the RCRA actions will be presented in this report.

A final remedy has not yet been chosen for Site 23 groundwater, a portion of OU9. It is expected that a decision regarding the need for an FS or an NFA decision document for groundwater will be made in 2007.

#### 20.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 23. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the decision for preparation of an FS for the groundwater OU at the Tank Farm be postponed until site conditions stabilize and the results of the current sampling and analysis program of the groundwater collection system determine the trends in groundwater contaminant concentrations. If the results of the monitoring program support that there are no unacceptable risks to human health or the environment, then an FS will not be prepared and the Navy will pursue an NFA ROD for the groundwater OU. If the results suggest that further actions are required, then the Navy will prepare an FS for the groundwater OU to develop appropriate remedial alternatives.

 It is expected that a decision regarding the need for an FS or an NFA decision document for Site 23 groundwater will be made in 2007.

Also, it was recommended that there be enforcement of the IR Site Use Restriction instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003. The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information from Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 23.

## 20.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 20.5.1 Document Review

The BGOURI (TtNUS, 2002a) and New London Instruction 5090.18C were the only documents reviewed for the second five-year review of Site 23. No other documents have been completed regarding this site within the past 5 years. The results of the BGOURI are discussed in Section 20.2.

### 20.5.2 Data Review

Groundwater/storm water data continue to be collected at Site 23. It is expected that the data will be presented and evaluated in an RI Update to be completed in 2007.

#### 20.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Site 23 groundwater; therefore, ARARs and site-specific action levels have not been identified.

# 20.5.4 Site Inspection

A site inspection conducted on April 4, 2006 included visual observations of the Site 23/Site 9 area. Weather conditions during the inspection were cold (mid-40s) and overcast with light precipitation. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. Appendix A contains one photograph taken of the Site 23/Site 9 (OT-5) area. During the inspection, the representatives discussed the information required to close the site.

Site 23 is within a partially fenced area that is currently used for recreation. Groundwater at the Tank Farm is not used for human consumption and it is not likely to be used for human consumption in the foreseeable future because of its current classification (i.e., GB groundwater that indicates that it is not suitable for direct human consumption without treatment). There is no short-term or long-term plan to convert this area to any other use.

#### 20.5.5 Site Interviews

No formal interviews were conducted for this site as part of the second five-year review because there were no active site issues to discuss.

### 20.6 ASSESSMENT

Because a final remedy has not been selected or implemented for Site 23 groundwater, conclusions cannot be made to support the determination that the remedy for Site 23 groundwater is protective of human health and the environment. The results of the BGOURI did not indicate any imminent threats to human health or the environment under the current land use scenario.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

#### **20.7 ISSUES**

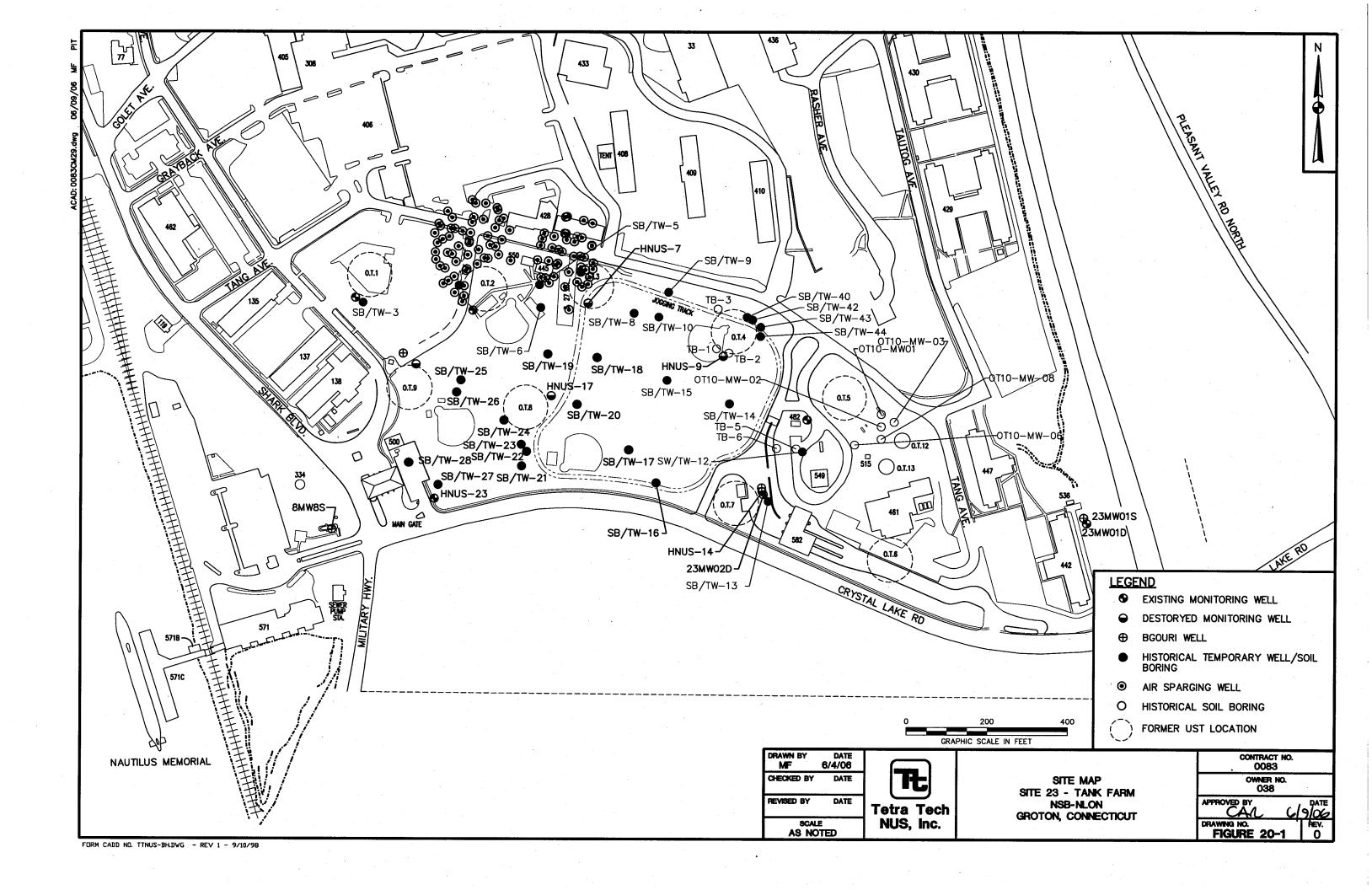
A final remedy has not been implemented for Site 23 groundwater; therefore, deficiencies cannot be determined at this time.

#### 20.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the results of the monitoring program be evaluated and a decision for preparation of an FS for the groundwater at the Tank Farm be made in 2007. If the results of the monitoring program and evaluation support that there are no unacceptable risks to human health or the environment, an FS should not be prepared and an NFA ROD for the groundwater OU should be prepared. It is also recommended that there be enforcement of the IR Site Use Restriction Instruction.

#### 20.9 PROTECTIVENESS STATEMENT

Previous actions completed under RCRA have addressed the soil OU at Site 23. The results of the BGOURI do not indicate any imminent threats to human health or the environment from groundwater under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated groundwater at Site 23 until a remedy is selected and implemented.



# 21.0 SITE 24 – LOWER SUBASE – CENTRAL PAINT ACCUMULATION AREA (OU4)

This five-year review is being conducted for Site 24 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 24 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 21.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 24 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Building 174 was refitted to contain boat anchor sandblasting and painting activities.	1982
Building 174 used as the primary paint storage facility for all paints used for boat maintenance activities.	Late 1980s
Final Lower Subase RI Report completed.	1999
First Five-Year Review completed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

# 21.2 BACKGROUND

Site 24 - Central Paint Accumulation Area (Building 174) is located in the northern section of the Lower Subase along the Thames River, immediately east of Pier 32. The site map is included as Figure 21-1. The location of Site 24 relative to other IR sites is shown on Figure 1-2.

In 1982, Building 174 was refitted to contain boat anchor sandblasting and painting activities (USEPA, 1995a). Also, in the late 1980s, the building was used as the primary paint storage facility for all paints used for boat maintenance activities (USEPA, 1995a).

No investigations of soil or groundwater were conducted at this site prior to the Lower Subase RI. Soil, groundwater, and sediment sampling in the adjacent Thames River were conducted at this site in conjunction with the Lower Subase RI (TtNUS, 1999b). For investigation purposes, Site 24 and the

surrounding area were identified as Zone 6. Because of this approach, the remainder of this section only discusses information in terms of Zone 6.

The Lower Subase RI Report (TtNUS, 1999b) recommended that Zone 6 proceed to an FS to evaluate appropriate remedial alternatives. Because of the extensive amount of underground utilities in Zone 6 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus, to the extent possible, on alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives. It was also recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 6, in conjunction with the soil remedial alternatives. A tiered groundwater monitoring program should be evaluated during the FS. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in soil are well defined to the extent practical considering limitations from existing infrastructures. Organic and inorganic contamination was infrequently detected at low concentrations in groundwater.
- The contaminants generally detected at Zone 6 are related to petroleum hydrocarbons and not to the historical operations at Site 24 Central Paint Accumulation Area.
- The baseline HHRA indicates that there are minimal risks to human receptors and they are not in excess of the USEPA acceptable risk range, and only the hypothetical future resident under the RME scenario slightly exceeds the CTDEP risk level. The baseline HHRA indicates that there are minimal risks to human receptors. Noncarcinogenic risks for all receptor groups were less than the USEPA and CTDEP acceptable limit. Carcinogenic risks for all receptors were either less than or within USEPA's acceptable target risk range. With the exception of the future resident under the RME scenario, all cancer risks were less than the CTDEP acceptable risk level. Benzo(a)pyrene and arsenic were the main contributors to the cancer risk for the future resident. In addition, lead was not a COC for this zone; therefore, modeling was not necessary to evaluate exposure to lead.
- Although reported concentrations of TPH in site soil samples exceeded the State RSRs for direct
  exposure and pollutant mobility, the chemical-specific risk assessment for the compounds assumed
  to be the major constituents of the observed TPH contamination (PAHs) indicated minimal risks to
  potential human receptors.
- Evidence suggests that organic contamination is generally not migrating from the site but that limited inorganic contamination may be migrating from the site. Natural attenuation processes seem to be at work in the groundwater. These processes can reduce concentrations of petroleum contamination

that reach the aquifer and convert the petroleum contamination to a less toxic form. Groundwater monitoring will confirm natural attenuation and the limited migration of inorganics.

- A tiered groundwater monitoring program will allow for further actions to be completed if the results show significant impacts.
- The ERA for the Thames River adjacent to Zone 6 shows that risks to ecological receptors in this
  area are relatively low.
- The Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 6.
- The zone is generally covered with pavement and a building, which minimizes direct exposure to contaminated soil by human receptors.
- The groundwater at Zone 6 is not currently or anticipated to be used in the future as a potable water source because it is brackish (classified by CTDEP as GB groundwater); therefore, there is no imminent threat to human health.
- Elevated levels of inorganics, particularly lead, were detected in sediment collected from a catch basin between Zones 5 and 6. Both zones contribute surface water to this catch basin. Slightly elevated levels of inorganics were also detected in surface water samples collected from the storm sewer system for the NPDES permit. Therefore, the storm sewer system in Zone 6 may be acting as a migration pathway for inorganic contaminants. The lead contamination is believed to be the result of storage of lead ballast in this area and surface water runoff. The Navy has eliminated the storage of ballast in this area.
- The storm sewer is Zone 6 is a potential migration pathway for contaminants present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Two catch basins in Zone 6 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

A FS is currently being prepared for Zone 6 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 6 will be selected after the FS is finalized.

#### 21.3 REMEDIAL ACTIONS

#### 21.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 6. An FS is currently being prepared to evaluate remedial alternatives for this zone. The Lower Subase RI (TtNUS, 1999b) recommended that the FS for Zone 6, which includes Site 24, should focus to the extent possible on alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives.

#### 21.3.2 Remedy Implementation

A final remedy has not been chosen for Zone 6. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

#### 21.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 24. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 6 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Navy, 2003). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 24.

### 21.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

### 21.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 24. Within the past 5 years, no other documents have been completed regarding this site.

#### 21.5.2 Data Review

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

# 21.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 6; therefore, ARARs and sitespecific action levels have not been identified for Zone 6.

### 21.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 6 is covered with pavement or buildings and is adjacent to the Thames River and railroad. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. No issues were identified during the inspection and no photos of the zone were taken during the inspection. The Navy has no additional plans to change the current use of the site.

#### 21.5.5 <u>Site Interviews</u>

No official interviews were conducted as part of the second five-year review.

#### 21.6 ASSESSMENT

Because a final remedy has not been selected for Zone 6, conclusions cannot be made to support the determination that the remedy at Zone 6 is protective of human health and the environment. The results

of the Lower Subase RI do not indicate any imminent threats to human health or the environment under the current land use scenario.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

#### 21.7 ISSUES

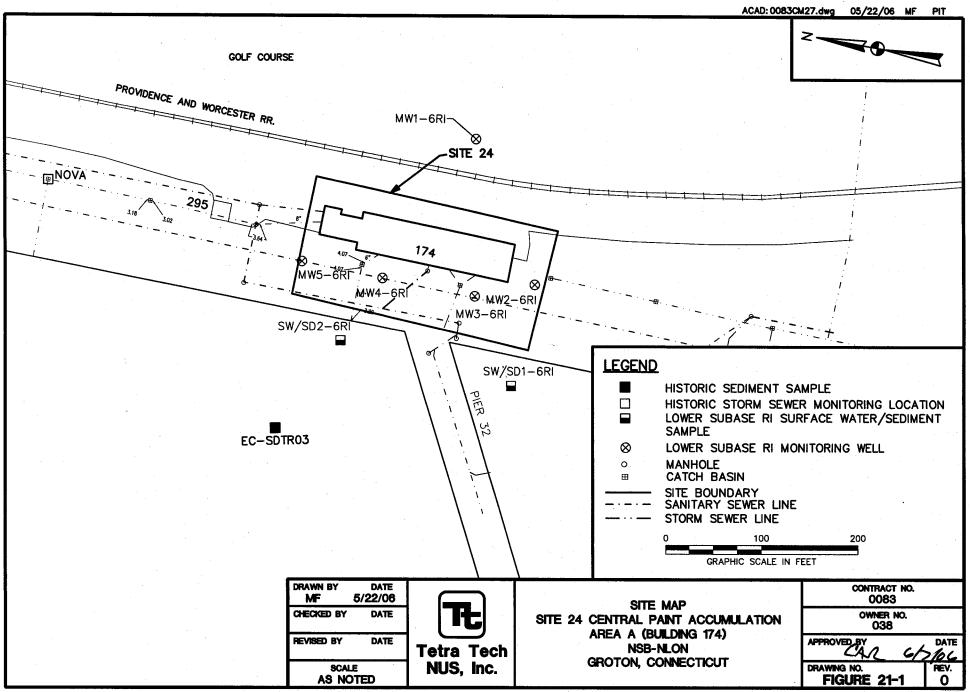
A final remedy has not yet been selected for Site 24; therefore, deficiencies cannot be determined at this time.

#### 21.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 6 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. It is also recommended that there be enforcement of the IR Site Use Restriction Instruction.

#### 21.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 6, which includes Site 24, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instruction should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.



# 22.0 SITE 25 – LOWER SUBASE – CLASSIFIED MATERIALS INCINERATOR (OU4)

This five-year review is being conducted for Site 25 because of CERCLA statutory requirements. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. Site 25 is currently being investigated under CERCLA. No decision documents have been prepared for this site.

#### 22.1 HISTORY AND SITE CHRONOLOGY

A list of important Site 25 historical events and relevant dates in the site chronology is shown below. The identified events are illustrative, not comprehensive.

Event	Date
Classified materials and solid wastes were burned in the incinerator.	1944-1963
Incinerator demolished.	1979
Final Site Inspection Report for Pier 33 and Berth 16 completed.	1995
Final Lower Subase RI Report completed.	1999
First Five-Year Review completed.	December 2001
Draft Final FS for soil and groundwater at the Lower Subase completed.	July 2002
SOPA (ADMIN) New London Instruction 5090.18C updated.	December 2006

#### 22.2 BACKGROUND

Site 25 consists of the former classified materials incinerator located on the Lower Subase, approximately 300 feet east of Pier 17. The site map is included as Figure 18-1. The site's location relative to other IR sites is shown on Figure 1-2.

It has been reported that, between 1944 and 1963, facilities within former Building 97 (current Building 478) were used to burn classified materials and other solid wastes generated at NSB-NLON (USEPA, 1995a). All materials generated by base operations that were not salvageable were incinerated at Site 25. Residual ash produced by materials burning were disposed in the Goss Cove Landfill (USEPA, 1995a). Adjacent to the incinerator was a dumpster-cleaning operation. The incinerator became inoperable in 1963 and operations ceased. The incinerator was demolished in 1979, and Buildings 456 and 478 were constructed.

The Site Inspection completed for the site included soil gas surveys, a utility inspection, drilling soil borings, installing monitoring wells, and soil, groundwater, and sediment sampling (Atlantic, 1995a). Petroleum and metals contamination were identified during the Site Inspection.

Soil, groundwater, and sediment sampling in the adjacent Thames River and analysis were completed for this site in conjunction with the Lower Subase RI (TtNUS, 1999b). This site was evaluated collectively with Site 21 as Zone 7 during the RI. Because of this approach, the remainder of this section discusses information in terms of Zone 7.

The Lower Subase RI Report (TtNUS, 1999b) recommended that Zone 7, which includes Site 21 - Berth 16, Site 25 - Classified Materials Incinerator, and Transformers at Building 157, Vault 31, proceed to an FS for evaluation of appropriate remedial alternatives for soil. Because of the extensive amount of underground utilities in Zone 7 and the sensitive nature of the activities conducted at this location (i.e., national security), the FS for this zone should focus, to the extent possible, on alternatives that rely on institutional controls to limit exposure to contaminated soil and passive and/or in-situ remedial alternatives. Hot spot removal actions for lead contamination should also be evaluated during the FS. In addition, it was recommended that the FS evaluate limited action scenarios for groundwater and the storm sewer system of Zone 7 in conjunction with the soil remedial alternatives. The scenario should include a tiered groundwater monitoring program. These recommendations are based on the following information:

- The nature and extent of organic and inorganic contamination in soil are well defined to the extent practical considering limitations from existing infrastructures.
- The baseline HHRA indicated that carcinogenic risks for full-time employees and hypothetical future residents under the RME scenario are in excess of the USEPA acceptable risk range and the CTDEP cumulative target ILCR. Noncarcinogenic risks for all receptor groups were less than the USEPA and CTDEP acceptable limit of 1.0, except for construction workers under the RME scenario. Although the RME HI for the construction workers slightly exceeded unity, adverse impacts are not anticipated because the major contributors (antimony and manganese) to the cumulative risk do not affect the same target organs. Cumulative risks to each individual target organ are expected to be less than unity. In addition, modeling performed to evaluate exposure to lead showed that all receptors (i.e., small children, fetuses of pregnant women, future employees, and construction workers) are at risk in Zone 7. These elevated risks (for lead, as well as other chemicals) assume that, sometime in the future, soils currently covered by pavement or buildings would be exposed and available for human contact.

- Evidence suggests that inorganic contamination (mainly lead) is migrating from soil to groundwater.
- Natural attenuation or bioremediation could be feasible alternatives for the petroleum contamination in soil.
- The Navy decommissioned the fuel lines within Zone 7. Therefore, the historical source of petroleum contamination has been eliminated.
- The zone is covered with pavement or buildings, which minimizes direct exposure to the contaminated soil by human receptors.
- The data do not suggest that the petroleum contamination in soil is significantly migrating to groundwater. In addition, natural attenuation processes seem to be at work in the groundwater. These processes can reduce concentrations of petroleum contaminants that reach the aquifer and convert the petroleum contamination to a less toxic form. Groundwater monitoring will confirm this information.
- A tiered groundwater monitoring program will allow for further actions to be completed if results show significant impacts.
- The source of the lead contamination in groundwater is the unsaturated soil of Zone 7. Appropriate
  remedial alternatives for Zone 7 soil will be evaluated in the FS. After the appropriate actions are
  taken, concentrations of lead in the groundwater will decrease.
- The ERA for the Thames River adjacent to Zone 7 showed that maximum concentrations of several non-AVS inorganics in Zone 7 sediments near the Lower Subase exceeded conservative guidelines (e.g., ER-Ls), indicating that potential risks may be present. The AVS/SEM analysis suggested that cadmium, copper, nickel, lead, and zinc are not bioavailable. Beryllium, cobalt, and vanadium were retained as COCs because no conservative sediment guidelines were available. No alternate guideline was available for barium, the maximum detected concentration of which exceeded the conservative guideline. The COCs were concluded to not be of ecological significance in the NSB-NLON Phase II RI ERA for the Thames River. Benzo(a)pyrene was the only organic in Zone 7 sediments that had maximum and average concentrations in excess of guidelines. HQ values were low, 1.39 for the maximum concentration and 1.11 for the average concentration. The maximum concentration of benzo(a)pyrene was much less than its ER-M. Significant toxicity was not observed in Zone 7 sediment toxicity tests from the NSB-NLON Phase II RI using *Leptocheirus*. Survival of *Ampelisca* was significantly lower than survival in reference sediments. Significant mortality was not

observed in Pier 17 EA toxicity tests with *Ampelisca*. The Pier 17 EA benthic community analyses concluded that the Pier 15 benthic community was relatively health, and the Pier 17 benthic community appeared to be disturbed. Significant bioaccumulation of some PAHs was observed in Pier 17 EA bioaccumulation studies with *Macoma* and *Nereis*. Some bioaccumulation of PCBs was noted in *Nereis* but not in *Macoma*. Significant bioaccumulation of inorganics was not observed in either species. Low concentrations of some inorganics and pesticides were detected in a blue mussel sample collected in Zone 7. The weight of evidence appears to be equivocal, suggesting significant potential risks to sediment-dwelling organisms from contaminants in Zone 7 near Pier 17 but not near Pier 15. However, most of the Pier 15 and Pier 17 sediments have been subsequently dredged, making interpretation of biological analyses from historical studies difficult. Sediments were replaced with "clean" fill after dredging, which may have ameliorated some of the potential risks. The NSB-NLON Phase II RI suggested that potential risk in the Lower Subase were confined to the Piers 15 and 17 area.

- The groundwater at Zone 7 is not currently or anticipated to be used in the future as a potable water source because it is brackish (CTDEP classified as GB); therefore, there is no imminent threat to human health.
- The Thames River provides significant dilution and mixing, which minimize the impact of any contaminant migration from Zone 7.
- The storm sewer in Zone 7 is a potential migration pathway for contaminant present in groundwater.

The Navy subsequently cleaned the Lower Subase storm sewer catch basins in August 2000. Five catch basins in Zone 7 were cleaned by Fleet Environmental using a vacuum truck. The material removed from the catch basins was containerized, tested (TCLP/TPH), and properly disposed off site. The storm sewer lines were not surveyed or repaired during the effort.

An FS is currently being prepared for Zone 7 soil and groundwater. The Navy is currently resolving ecological risk issues related to the adjacent Thames River. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy for Zone 7 will be selected after the FS is finalized.

#### 22.3 REMEDIAL ACTIONS

## 22.3.1 Remedy Selection

A final remedy has not been selected or implemented for Zone 7, which includes Site 25. An FS is currently being prepared to evaluate alternatives for the zone. The Lower Subase RI recommended that

the FS for Zone 7 evaluate appropriate remedial alternatives for soil including institutional controls, passive and/or in-situ technologies, and hot spot removal actions for lead contamination. In addition, it was recommended that the FS evaluate limited action scenarios for groundwater at Zone 7.

#### 22.3.2 Remedy Implementation

A final remedy has not yet been chosen for Zone 7. It is expected that the FS for the Lower Subase will be finalized in 2007. A remedy will be selected after the FS is finalized.

#### 22.4 PROGRESS SINCE LAST REVIEW

This is the second five-year review of the Site 25. The recommendations from the First Five-Year Review Report are provided below along with the actions that were taken to address the recommendations.

It was recommended that the FS be completed to determine the appropriate remedial action for Zone 7 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative.

The FS for the Lower Subase is in progress, and it is expected to be completed in 2007. Ecological
issues related to the Thames River are currently being resolved. A decision document will be
prepared upon completion of the FS.

In addition, it was recommended that there be enforcement of the IR Site Use Restriction instruction.

• The instruction was updated to include the Goss Cove Landfill and was reissued in 2003 (Navy, 2003). The instruction was also updated in 2006 (Instruction 5090.18C) to include Sites 3 and 7 and additional information for Site 2A - Area A Landfill. The instruction details the restrictions on disturbance of soils and/or groundwater at IR sites at NSB-NLON. The instruction has been enforced as appropriate at Site 25.

#### 22.5 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken to complete this review.

#### 22.5.1 Document Review

New London Instruction 5090.18C was the only document reviewed for the second five-year review of Site 25. Within the past five years, no other documents have been completed regarding this site.

#### 22.5.2 Data Review

No new data were collected from the site over the past 5 years. No monitoring or O&M activities have been initiated at the site because a final remedy has not been selected.

### 22.5.3 ARAR and Site-Specific Action Level Changes

A remedy has not been selected and a ROD has not been signed for Zone 7; therefore, ARARs and sitespecific action levels have not been identified for Zone 7.

# 22.5.4 Site Inspection

The Lower Subase was visually inspected on April 4, 2006 as the inspection team drove through the area. Zone 7 is covered with pavement or buildings and is located near the Thames River and a set of railroad tracks. The Lower Subase is a high-security area at NSB-NLON, and to avoid security issues, the team conducted a drive-through inspection lead by the Navy. Weather conditions during the inspection were cold (mid-40s), overcast, and windy. Representatives from the Navy, USEPA, CTDEP, TtNUS, ECC, and Gannett Fleming participated in the inspection. It was noted during the site inspection that an extension to Building 157 (Zone 7) was being built. Excavated soil from near Building 157 had been stockpiled, and samples from the stockpile had been tested for TCLP lead and had failed. The soil was to be disposed at an approved off-site disposal facility. No photos of the zone were taken during the inspection. The Navy has no additional plans to change the current use of the site.

#### 22.5.5 Site Interviews

No official interviews were conducted as part of the second five-year review.

#### 22.6 ASSESSMENT

Because a final remedy has not been selected for Zone 7, conclusions cannot be made to support the determination that the remedy at Zone 7 is protective of human health and the environment. The results of the Lower Subase RI do no indicate any imminent threats to human health or the environment as long as site conditions remain the same.

The Navy has an IR Site Use Restriction Instruction in place at NSB-NLON [SOPA (ADMIN) NLONINST 5090.18C]. The policy restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR Sites.

### 22.7 ISSUES

A final remedy has not yet been implemented for Zone 7; therefore, deficiencies in the remedial action cannot be determined at this time.

#### 22.8 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

It is recommended that the FS be completed to determine the appropriate remedial action for Zone 7 that is protective of human health and the environment. An appropriate decision document should be prepared after the FS is completed to document the selected remedial alternative. Also, it is recommended that there be enforcement of the IR Site Use Restriction Instruction.

#### 22.9 PROTECTIVENESS STATEMENT

A protectiveness determination for Zone 7, which includes Site 25, cannot be made at this time because a remedy has not yet been selected for the zone. The results of the Lower Subase RI do not indicate any imminent threats to human health or the environment under current land use scenarios. The Navy has instituted an instruction that provides land use controls and restricts excavation activities. The instructions should minimize unauthorized and unplanned exposure to contaminated media at the zone until a remedy is selected and implemented. The Navy is currently addressing data gaps for the zone as part of development of the FS.

## 23.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of the second five-year review are presented below. They are provided in the form of a basewide protectiveness statement and a summary of the requirements of the next five-year review.

#### 23.1 PROTECTIVENESS STATEMENT

The remedial actions that have been completed for the sites at NSB-NLON are protective of human health and the environment. Remedial actions to address immediate or potential future threats from exposure to soil and sediment have been implemented [Sites 1, 2 (Area A Landfill), 3, 4, 6, 7, 8, 9, 13, 14, 15, 17, 20, and 23] or are expected to be implemented by the end of the Year 2007 (Sites 3 – NSA). Groundwater monitoring programs are ongoing at Sites 2 (Area A Landfill), 3, 6, 7, and 8 to monitor contaminant trends and confirm the protectiveness of the soil remedial actions completed at the sites. Investigations found that no contamination was present in the soil at Sites 16 and 18 or the groundwater at Sites 14, 15, 18, and 20 that would result in immediate or potential future threats and NFA RODs were subsequently prepared for these sites. The Navy is continuing CERCLA investigations of the remaining IR sites. Additionally, the Navy has implemented and enforced an IR Site Use Restriction Instruction that restricts ground surface disturbance of soils and any subsurface disturbance of soils and/or groundwater at IR sites.

This five-year review shows that the Navy is generally meeting the requirements of the RODs for the sites at NSB-NLON. The deficiencies identified during the review and the approaches and milestone dates to address the deficiencies are provided in Table 23-1.

#### 23.2 NEXT REVIEW

Five-year reviews are required by statute under CERCLA for NSB-NLON. Remedial actions were conducted at IRP sites at NSB-NLON that allowed hazardous substances, pollutants, or contaminants to remain on site in excess of levels that allow for unlimited use and unrestricted exposure. This report represents the Second Five-Year Review conducted at NSB-NLON. The next five-year review will be required in December 2011 (i.e., within 5 years of the signature date of this second five-year review). The anticipated requirements for the next five-year review are as follows:

 A review of the costs for implementing the removal action at Site 3 – NSA and the remedial action at Site 7.

- An evaluation of the groundwater monitoring activities at Sites 2 (Area A Landfill), 3, 6, 7, and 8.
- A review of the O&M activities at Sites 2 (Area A Landfill), 3, 6, 7, and 8 along with the costs for the activities. The O&M Manual should be updated as required over the next five years.
- A review of the ESD prepared for Site 3.
- Verify that New London Instruction 5090.18C for institutional controls has been properly implemented. Also, verify that at least yearly monitoring of Institutional Control compliance has been conducted.

# 23.2.1 Continued Reviews

Sites 2 (Area A Landfill), 3, 6, 7, and 8 will require evaluation during the next five-year review for NSB-NLON. Five-year reviews will continue at these sites because hazardous substances, pollutants, and contaminants remain at the sites that will not allow for the unlimited use or unrestricted exposure. Reviews will also be completed for Sites 2 (Area A Wetland) 9, 10, 11, 13, 17, 19, 21, 22, 23, 24, and 25 because CERCLA activities are ongoing at these sites. It is anticipated that RODs will be completed for these sites and remedial actions will be in progress at the time of the next review. The next review will update the appropriate sections to discuss the remedial actions that occurred at these sites.

### 23.2.2 <u>Discontinue Reviews</u>

Five-year reviews are not required in the future for Sites 1, 4, 14, 15, 16, 18, and 20 because NFA decision documents have been signed for these sites and there are no hazardous substances, pollutants, and contaminants remaining at the sites. Therefore, the use of these sites is unlimited and there are no exposure restrictions.

# ISSUES IDENTIFIED DURING THE SECOND FIVE-YEAR REVIEW NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 1 OF 4

Issue	Effects Protectiveness		Recommendation to	Milestone
	Current	Future	Address Issue	Date
Site 2 – Area A Landfill				-
Gas vents require screens	N	N	Install screens on gas vents.	30 Jan 07
O&M of cap system [vegetation (Phragmites, trees, etc.), sediment, and asphalt cracks]	N	Y	Continue O&M of cap system.	30 Jan 07
Improper storage of heavy equipment on cap	N	Y	Complete New London Instruction 5090.18C to include equipment storage information and	22 Dec 06
			Develop and implement an equipment storage plan.	15 Jan 07
			Initiate at least yearly monitoring of Institutional Control compliance.	30 Nov 07
Maintenance/abandonment of monitoring wells	Y	Y	Continue maintenance of monitoring wells in the monitoring program and develop and implement a well abandonment program for wells not included in the program.	30 May 07
Depression in rip rap along toe of the landfill	N	Υ	Continue to monitor depression.	30 Jan 07
Site 3 – Area A Downstream/OBDA				
New London Instruction 5090.18B does not include land use control information for Site 3.	N	Y	Complete New London Instruction 5090.18C to include Site 3 land use control information (soil and groundwater).	22 Dec 06
			Initiate at least yearly monitoring of Institutional Control compliance.	30 Nov 07

# ISSUES IDENTIFIED DURING THE SECOND FIVE-YEAR REVIEW NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 2 OF 4

Issue	Effects Protectiveness		Recommendation to	Milestone
	Current	Future	Address Issue	Date
Monitoring wells were not maintained or properly abandoned.	N	Y	Perform maintenance of monitoring wells in the monitoring program and develop and implement a well abandonment program for wells not included in the program.	30 May 07
An ESD is required to document the contaminated soil that was encapsulated at Stream 4.	N	Y	Complete an ESD for the encapsulated contaminated soil at Stream 4.	29 Jun 07
Site 6 – DRMO				
Ponding of water along jersey barriers	N	Y	Provide drains in jersey barriers to eliminate ponding.	30 Jan 07
Cracks and depressions in asphalt	N	Y	Continue O&M of cap system.	30 Jan 07
Maintenance of monitoring wells and sampling equipment	N	Y	Continue maintenance of monitoring wells in the monitoring program.	30 Jan 07
			Initiate at least yearly monitoring of Institutional Control compliance.	30 Nov 07
Abandonment of unused monitoring wells	N	Y	Develop and implement a well abandonment program for wells not included in the program.	30 May 07
Site 7 – Torpedo Shops				
New London Instruction 5090.18B does not include land use control information for Site 7.	N	Y	Complete New London Instruction 5090.18C to include Site 7 land use control information (groundwater).	22 Dec 0
			Initiate at least yearly monitoring of Institutional Control compliance.	30 Nov 07

# ISSUES IDENTIFIED DURING THE SECOND FIVE-YEAR REVIEW NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 3 OF 4

Issue	Effects Protectiveness		Recommendation to	Milestone
	Current	Future	Address Issue	Date
Monitoring wells were not maintained or properly abandoned.	N	Y	Perform maintenance of monitoring wells in the monitoring program and develop and implement a well abandonment program for wells not included in the program.	30 May 07
Site 8 – Goss Cove Landfill				
Gas vents require screens	N	N	Install screens on gas vents.	30 Jan 07
Sprinkler system requires repair	N	Y	Repair the sprinkler system.	30 Jan 07
Maintenance of monitoring wells and dedicated sampling equipment	N	N	Perform maintenance of monitoring wells and dedicated sampling equipment in the monitoring program.	30 Jan 0
			Initiate at least yearly monitoring of Institutional Control compliance.	30 Nov 07
Abandon unused monitoring wells	N	N	Develop and implement a well abandonment program for wells not included in the program.	30 May 07
Hazardous materials not being properly stored in locked storage lockers	N	N	Install locks on the hazardous materials storage lockers.	Completed by 30 Nov 06
No warning signs on gates	N	Y	Place signs on the front gate of the site that warn of site land use controls.	30 Jan 07
Site 14 – OBDANE				
Abandon unused monitoring well	N	Y	Develop and implement a well abandonment program	30 May 07
Site 15 – SASDA	•	•	•	•
Abandon unused monitoring wells	N	Y	Develop and implement a well abandonment program	30 May 07

# ISSUES IDENTIFIED DURING THE SECOND FIVE-YEAR REVIEW NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT PAGE 4 OF 4

Issue	Effects Pro	tectiveness	Recommendation to	Milestone
	Current	Future	Address Issue	Date
Site 20 – Area A Weapons Center	·			•
Abandon unused monitoring wells	N	Y	Develop and implement a well abandonment program	30 May 07

#### REFERENCES

Atlantic (Atlantic Environmental Services, Inc.), 1992. Phase I Remedial Investigation Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. August.

Atlantic, 1994a. Draft Focused Feasibility Study, DRMO, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. March.

Atlantic, 1994b. Draft Focused Feasibility Study, Spent Acid Storage and Disposal Area, Installation Restoration Program, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. March.

Atlantic, 1994c. Draft Focused Feasibility Study, Area A Downstream/OBDA, Installation Restoration Program, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. April.

Atlantic, 1995a. Final Site Inspection Report, Pier 33 and Berth 16/Former Incinerator, Installation Restoration Program, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. February.

Atlantic, 1995b. Action Memorandum for the Defense Reutilization and Marketing Office and the Spent Acid Storage and Disposal Area, Installation Restoration Program. Colchester, Connecticut. March.

Atlantic, 1995c. Final Focused Feasibility Study, Area A Landfill, Installation Restoration Program, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. May.

Atlantic, 1995d. Proposed Plan for the Area A Landfill, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. June.

Atlantic, 1995e. Record of Decision for the Area A Landfill, Naval Submarine Base – New London, Groton, Connecticut. Colchester, Connecticut. September.

B&R Environmental (Brown and Root Environmental), 1996a. Site Characterization Report for OT-10, Building 325 and Building 89, Naval Submarine Base – New London, Groton, Connecticut. Wayne, Pennsylvania.

B&RE, 1996b. Revised Design Analysis Report for Area A Landfill for Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. December.

B&RE, 1997a. Phase II Remedial Investigation Report for Naval Submarine Base - New London, Groton, Connecticut. Wayne, Pennsylvania. March.

B&RE, 1997b. Proposed Plan for Area A Downstream/OBDA (Site 3), Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. July.

B&RE, 1997c. Data Gap Investigation Report for Goss Cove Landfill, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. August.

B&RE, 1997d. Site Investigation Report for Tank Farm Investigation for Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. September.

B&RE, 1997e. Proposed Remedial Action Plan, DRMO, Naval Submarine Base - New London, Groton, Connecticut. Brown & Root Environmental, King of Prussia, Pennsylvania. September.

B&RE, 1997f. Feasibility Study for Defense Reutilization and Marketing Office (Site 6), Naval Submarine Base New London. King of Prussia, Pennsylvania. November

B&RE, 1997g. Feasibility Study for Soil and Sediment, Area A Downstream/OBDA (Site 3), Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. December.

B&RE, 1998a. Groundwater Monitoring Plan for Defense Reutilization and Marketing Office, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. February.

B&RE, 1998b. Final Interim Record of Decision for the Defense Reutilization and Marketing Office, Naval Submarine Base - New London, Groton, Connecticut. Northern Division, Lester, Pennsylvania. March.

B&RE, 1998c. Final Report for Interim Remedial Action at Area A Landfill, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. March.

B&RE, 1998d. Record of Decision for Soil and Sediment, Area A Downstream Watercourses/Overbank Disposal Area, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. March.

B&RE, 1998e. Interim Groundwater Monitoring Report for Defense Reutilization and Marketing Office, Naval Submarine Base, New London, Groton, Connecticut. King of Prussia, Pennsylvania. July.

Cubbage, J., D. Batts, and S. Breidenbach. 1997. Creation and Analysis of Freshwater Sediment Quality Values in Washington State. Washington State Department of Ecology. Publication No. 97-323a. July.

CTDEP (Connecticut Department of Environmental Protection), January 1996. "Remediation Standard Regulations." Bureau of Water Management, Permitting, Enforcement and Remediation Division, Hartford. Connecticut.

CTDEP, 1997. Water Quality Standards. Effective April 9, 1997. Accessed from the Internet, April 30, 2001. http://dep.state.ct.us/wtr/wqsinfo.htm

CTDEP, 1999a. Phase I/II Environmental Site Assessment Report, Fusconi Dry Cleaners. Hartford, Connecticut. March

CTDEP, 1999b. Approved Criteria for Additional Polluting Substances, April 30.

CTDEP, 2002. Water Quality Standards. Effective December 17, 2002.

CTDEP, 2003. Connecticut's Remediation Standard Regulations Volatilization Criteria. Proposed Revisions. March.

EA Engineering, 2000a. Proposed Plan for Soil and Sediment at Area A Weapons Center, Naval Submarine Base- New London, Groton, Connecticut. May.

EA Engineering, 2000b. Feasibility Study for Area A Weapons Center, Naval Submarine Base - New London, Groton, Connecticut. June.

EA Engineering, 2002. Draft Final Feasibility Study for Soil and Groundwater at the Lower Subase, Naval Submarine Base - New London, Groton, Connecticut. July.

ECC (Environmental Chemical Corporation), 2003a. Round 12 Groundwater Monitoring Report for the Area A Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts, September.

ECC, 2003b. Round 6 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. November.

ECC, 2004a. Round 7 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. January.

ECC. 2004b. Annual Landfill Inspection Report for Area A Landfill (2003), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. November

ECC. 2004c. Annual Landfill Inspection Report for Defense Reutilization and Marketing Office (DRMO) (2003), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. November

ECC. 2004d. Annual Landfill Inspection Report for Goss Cove Landfill (2003), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. November

ECC, 2004e. Year 4 Annual Groundwater Monitoring Report for the Area A Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. December.

ECC, 2004f. Year 5 Annual Groundwater Monitoring Report for the DRMO, New London, Groton, Connecticut. Marlborough, Massachusetts. December.

ECC, 2004g. Year 2 Annual Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. December.

ECC, 2005a. Round 9 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. February.

ECC, 2005b. Round 10 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. February.

ECC, 2005c. Round 11 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. February.

ECC, 2005d. Round 14 Groundwater Monitoring Report for the Area A Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. February.

ECC, 2005e, Box Culvert Video Inspection, August 6, 2004, Goss Cove Landfill, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. February.

ECC. 2005f. Year 5 Annual Groundwater Monitoring Report for Area A Landfill, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. August.

ECC. 2005g. Year 6 Annual Groundwater Monitoring Report for Defense Reutilization and Marketing Office (DRMO), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. August.

ECC. 2005h. Year 3 Annual Groundwater Monitoring Report for Goss Cove Landfill, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. August.

ECC. 2005i. Annual Landfill Inspection Report for Area A Landfill (2004), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. September.

ECC. 2005j. Annual Landfill Inspection Report for Defense Reutilization and Marketing Office (DRMO) (2004), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. September.

ECC. 2005k. Annual Landfill Inspection Report for Goss Cove Landfill (2004), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. September.

ECC, 2005l. Final Round 13 Groundwater Monitoring Report for the Goss Cove Landfill, New London, Groton, Connecticut. Marlborough, Massachusetts. September.

ECC. 2005m. Annual Landfill Inspection Report for Area A Landfill (2005), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. October.

ECC. 2005n. Annual Landfill Inspection Report for Defense Reutilization and Marketing Office (DRMO) (2005), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. October.

ECC. 2005o. Annual Landfill Inspection Report for Goss Cove Landfill (2005), Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. October.

ECC. 2006a. Year 7 Annual Groundwater Monitoring Report for Defense Reutilization and Marketing Office, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. January.

ECC. 2006b. Final Round 16 Groundwater Monitoring Report for Area A Landfill, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. January.

ECC. 2006c. Final Round 14 Groundwater Monitoring Report for Goss Cove Landfill, Naval Submarine Base - New London, Groton, Connecticut. Marlborough, Massachusetts. January.

Efroymson, R.A., M.E. Will, and G.W. Suter II, 1997a. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Oak Ridge National Laboratory, ES/ER/TM-126/R2. November.

Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. Oak Ridge National Laboratory, ES/ER/TM-85/R3. November.

Envirodyne (Envirodyne Engineers Inc.), 1982. Initial Assessment Study: Naval Submarine Base, New London, Connecticut. Prepared for Naval Assessment and Control of Installation Pollutants Department.

Envirodyne (Envirodyne Engineers, Inc.), 1983. Final Initial Assessment Study of Naval Submarine Base, New London, Connecticut. NEESA (Naval Energy and Environmental Support Activity), 13-025. Port Hueneme, California. March.

ERM (Environmental Resource Management), 1991. Installation and Sampling of Monitoring Wells at the Fuel Farm, Naval Submarine Base - New London, Groton, Connecticut. Exton, Pennsylvania. June.

FWEC (Foster Wheeler Environmental Corporation), 1997a. Final Work Plan for Area A Landfill Cap, Naval Submarine Base - New London, Groton, Connecticut. Boston, Massachusetts. February.

FWEC, 1997b. Final Post Removal Report for Over-Bank Disposal Area at Naval Submarine Base New London, Groton, Connecticut. Boston, Massachusetts. July.

FWEC, 2000. 100% Design, Area A/OBDA, Naval Submarine Base New London, Groton, Connecticut. Boston, Massachusetts. April.

FWEC, 2001a. Remedial Action Completion Report, Area A Downstream/OBDA Remediation, Naval Submarine Base New London, Groton, Connecticut. Boston, Massachusetts. February.

FWEC, 2001b. Draft Post Construction Monitoring Report, Area A Downstream/OBDA, Naval Submarine Base New London, Groton, Connecticut. Boston, Massachusetts. February.

FWEC, 2001c. Final Long-Term Wetland Monitoring Plan for Area A Downstream/OBDA, Naval Submarine Base - New London, Groton, Connecticut. Boston, Massachusetts. September

FWEC, 2002a. Final Remedial Action Report for Over Bank Disposal Area Northeast Remediation, Naval Submarine Base New London, Groton, Connecticut. Boston, Massachusetts. February.

FWEC, 2002b. Final Remedial Action Report for Soil and Sediment Removal at Operable Unit 7 - Area A Weapons Center (Site 20) at Naval Submarine Base - New London, Groton, Connecticut. Langhorn, Pennsylvania. June.

FWEC, 2002c. Final Remedial Action Report for Site 8 - Goss Cove Landfill, Naval Submarine Base - New London, Groton, Connecticut. Langhorn, Pennsylvania. September.

FWEC, 2002d. Final Year 1 Long-Term Monitoring Report for Area A Downstream/OBDA, Naval Submarine Base - New London, Groton, Connecticut. Langhorn, Pennsylvania. November.

FWEC, 2003. Final Year 2 Long-Term Monitoring Report for Area A Downstream/OBDA, Naval Submarine Base - New London, Groton, Connecticut. Langhorn, Pennsylvania. June.

FWEC, 2004. Final Year 3 Long-Term Monitoring Report for Area A Downstream/OBDA, Naval Submarine Base - New London, Groton, Connecticut. Langhorn, Pennsylvania. October.

Fuss & O'Neill Engineers, 1989. Hydrogeologic Investigation – Underground Storage Tanks OT-4, OT-7, OT-8, OT-9, and 54-H, Naval Submarine Base – Groton, Connecticut.

GZA (Goldberg-Zoino & Associates), 1988. DRMO Conforming Storage Facility Report.

GZA GeoEnvironmental, Inc., 1991. UST – Removal – Waste Oil Tank 5 (OT-5), Naval Submarine Base – New London, Groton, Connecticut. December.

HNUS (Halliburton NUS Corporation), 1993a. Action Memorandum for Building 31, Naval Submarine Base - New London, Groton, Connecticut. Wayne, Pennsylvania. May.

HNUS, 1993b. Remedial Design for Building 31, Naval Submarine Base - New London, Groton, Connecticut. Wayne, Pennsylvania. May.

HNUS, 1994a. Site Characterization Report for Waste Oil Tank 5, Naval Submarine Base – New London, Groton, Connecticut. Wayne, Pennsylvania. May.

HNUS, 1994b. Post Removal Action Report for Waste Oil Tank No. 5, Naval Submarine Base – New London, Groton, Connecticut. Wayne, Pennsylvania. December.

HNUS, 1995. Post-Removal Action Report for Building 31 Lead Remediation, Naval Submarine Base – New London, Groton, Connecticut. Wayne, Pennsylvania. January.

HNUS, 1995b. Draft Final Characterization Report for OT-10, Building 325, and Building 89 for Naval Submarine Base, New London, Groton, Connecticut. Wayne, Pennsylvania. April.

Heitkamp, Inc., 1996. Results of Pneumatic Testing on the Fuel Distribution System. Environmental Department, Naval Submarine Base – New London, Groton, Connecticut.

Long, Edward, R., D.D. MacDonald, S.L. Smith, F.D. Calder, 1995. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. Environmental Management.

Navy (Department of the Navy), 1995. Record of Decision, Source Control Operable Unit, Area A Landfill, Naval Submarine Base – New London, Groton, Connecticut. Northern Division, Lester, Pennsylvania. September.

Navy, 1997a. Action Memorandum for Overbank Disposal Area, Naval Submarine Base New London, Groton, Connecticut. Northern Division, Lester, Pennsylvania. July.

Navy, 1997b. Record of Decision for the Spent Acid Storage and Disposal Area, Naval Submarine Base - New London, Groton, Connecticut. Northern Division, Lester, Pennsylvania. September.

Navy, 1998. Final Record of Decision for Soil and Sediment, Area A Downstream Water Courses/Overbank Disposal Area, Naval Submarine Base - New London, Groton, Connecticut. Northern Division, Lester, Pennsylvania. March.

Navy, 1999. Navy Policy for Conducting Ecological Risk Assessments. Memo from Chief of Naval Operations to Commander, Naval Facilities Engineering Command, 05 April 1999. Department of the Navy, Washington, DC.

Navy, 2000a. Record of Decision for Area A Weapons Center, Naval Submarine Base – New London, Groton, Connecticut. June.

Navy, 2000b. SOPA (ADMIN) New London Instruction 5090.18 - Installation Restoration Site Use Restrictions at Naval Submarine Base New London, R. W. Rupple, Commanding Officer, Naval Submarine Base New London, Groton, Connecticut. October.

Navy, 2003. SOPA (ADMIN) New London Instruction 5090.18B - Installation Site Use Restrictions at Naval Submarine Base New London, J. E. Ratte, Jr., Commanding Officer, Naval Submarine Base New London, Groton, Connecticut. February.

Navy, 2004a. Naval Submarine Base - New London; Site 3 - New Source Area Soil, Proposed Plan. July

Navy, 2004b. Naval Submarine Base - New London; Site 7 - Torpedo Shops and Site 14 - Overbank Disposal Area Northeast Soil – Operable Unit 8, Proposed Plan. July.

Navy, 2004c. Naval Submarine Base - New London; Site 16 - Hospital Incinerators and Site 18 - Solvent Storage Area Soil - Operable Unit 11, Proposed Plan. July.

Navy, 2004d. Naval Submarine Base - New London; Site 3 - Area A Downstream Watercourses, Site 7 - Torpedo Shops, Site 14 - Overbank Disposal Area Northeast, Site 15 - Spent Acid Storage and Disposal Area, Site 18 - Solvent Storage Area, and Site 20 - Area A Weapons Center Groundwater, Proposed Plan. September.

Navy. 2004e. Record of Decision for Site 3 - New Source Area Soil (OU3), Naval Submarine Base, New London, Groton, Connecticut. Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania. September.

Navy, 2004f. Record of Decision for Site 7 - Torpedo Shops and Site 14 - Overbank Disposal Area Northeast Soil (OU8), Naval Submarine Base, New London, Groton, Connecticut. Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania. September.

Navy. 2004g. Record of Decision for Sites 16 and 18 Soil (Operable Unit 11), Naval Submarine Base, New London, Groton, Connecticut. Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania. September.

Navy, 2004h. Interim Record of Decision for Sites 3, 7, 14, 15, 18, and 20 Groundwater, Naval Submarine Base, New London, Groton, Connecticut. Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania. December.

Navy, 2006a. Proposed Plan for Site 6 - Defense Reutilization and Marketing Office/Operable Unit 2, Naval Submarine Base - New London, Groton, Connecticut. Naval Facilities Engineering Command Mid-Atlantic, Norfolk, Virginia. October

Navy, 2006b. SOPA (ADMIN) New London Instruction 5090.18C - Installation Site Use Restrictions at Naval Submarine Base New London, Mark S. Ginda, Commanding Officer, Naval Submarine Base New London, Groton, Connecticut. December.

Navy, 2006c. Record of Decision for Operable Unit 2 - Site 6 and Groundwater, Naval Submarine Base New London, Groton, Connecticut. Naval Facilities Engineering Command Mid-Atlantic, Norfolk, Virginia. December.

NEESA (Naval Energy and Environmental Support Activity), 1983. Final Initial Assessment Study of Naval Submarine Base New London, Connecticut. NEESA 13-025. Port Hueneme, California. March.

NESO, 1979. Oil Contamination of the Ground Water at SUBASE. Naval Environmental Support Office 1-026. February.

OHM (OHM Remediation Services Corporation), 1995a. Final Report for Interim Remedial Action, Site 6, Naval Submarine Base, New London, Groton, Connecticut. Hopkinton, Massachusetts. September.

OHM, 1995b. Final Report for Soil Remediation, Spent Acid Storage and Disposal Area, Naval Submarine Base, New London, Groton, Connecticut. Hopkinton, Massachusetts. September.

OME (Ontario Ministry of the Environment), 1992. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Toronto, Canada.

OME, 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of Environment and Energy. August.

Opresko, D.M., B.E. Sample, and G.W. Suter, 1994. Toxicological Benchmarks for Wildlife. Oak Ridge National Laboratory, Oak Ridge, Tennessee. ES/ER/TM-86/RI.

SAIC (Science Applications International Corporation), 1998. Draft Evaluation of Chemical and Toxicological Data for Goss Cove, Naval Submarine Base, Groton, Connecticut. Newport, Rhode Island. December.

Sample, B.E., D.M. Opresko, and G.W. Suter II, 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory, ES/ER/TM-86/R3. June.

Suter, G.W. II. and C.L. Tsao, 1996. Toxicological Benchmarks for Screening Potential Constituents of Concern for Effects on Aquatic Biota:1996 Revision. Environmental Sciences Division, Oak Ridge National Laboratory, ES/ER/TM-96/R2.

Tetra Tech FW, Inc. (TtFW), 2004. Final Year 3 Long-Term Monitoring Report for Area A Downstream/OBDA, Naval Submarine Base - New London, Groton, Connecticut. Boston, Massachusetts. October.

TtEC (Tetra Tech EC, Inc.), 2005. Predesign Investigation Report, Site 7, Naval Submarine Base New London, Groton, Connecticut. Langhorn, Pennsylvania.

TtEC, 2006. Final Work Plan for Soil Excavation at Torpedo Shops, Operable Unit 8 - Site 7. Langhorn, Pennsylvania.

TtNUS (Tetra Tech NUS, Inc.), 1999a. Groundwater Monitoring Plan for Area A Landfill, Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. January.

TtNUS, 1999b. Final Lower Subase Remedial Investigation Report, Naval Submarine Base – New London, Groton, Connecticut. Tetra Tech NUS, Inc., King of Prussia, Pennsylvania. January.

TtNUS, 1999c. Summary Report for Hydrogeologic Study at the Tank Farm, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. February.

TtNUS, 1999d. Feasibility Study for Goss Cove Landfill (Site 8) Soil Operable Unit, Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. September.

TtNUS, 1999e. Record of Decision for Site 8 Goss Cove Landfill, Soil and Sediment, Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. September.

TtNUS, 1999f. Tank Farm Site Investigation Report Addendum, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. November.

TtNUS, 1999g. Draft Annual Groundwater Monitoring Report for Defense Reutilization and Marketing Office (DRMO), Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. November.

TtNUS, 2000a. Draft Year 2 Annual Groundwater Monitoring Report for Defense Reutilization and Marketing Office (DRMO), Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. October.

TtNUS, 2000b. Bidding Document Submission (REV 01) of the Remedial Design for Goss Cove Landfill (Site 8), Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. November.

TtNUS, 2001a. Groundwater Monitoring Plan for Goss Cove Landfill, Naval Submarine Base-New London, Groton, Connecticut. King of Prussia, Pennsylvania. March.

TtNUS, 2001b. Year 1 Annual Groundwater Monitoring Report for the Area A Landfill, Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. May.

TtNUS, 2001c. First Five-Year Review Report for CERCLA Sites at Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. December.

TtNUS, 2002a. Basewide Groundwater Operable Unit Remedial Investigation, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. January.

TtNUS, 2002b. Year 3 Groundwater Monitoring Report for DRMO, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. March.

TtNUS, 2002c. Draft Final Operations and Maintenance Manual for Installation Restoration Program Sites at Naval Submarine Base – New London, Groton, Connecticut. Volumes I, III, IV, and V. King of Prussia, Pennsylvania. September.

TtNUS, 2002d. Letter Work Plan for Geochemical Investigation at the Area A Landfill, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. September.

TtNUS, 2002e. Work Plan for Basewide Groundwater Operable Unit Data Gap Investigation, Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. October.

TtNUS, 2002f. Year 2 Annual Groundwater Monitoring Report for the Area A Landfill, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. December.

TtNUS, 2003a. Draft Operations and Maintenance Manual for Installation Restoration Program Sites at Naval Submarine Base – New London, Groton, Connecticut. Volume II. King of Prussia, Pennsylvania. March.

TtNUS, 2003b. Year 3 Annual Groundwater Monitoring Report for the Area A Landfill, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. July.

TtNUS, 2003c. Year 1 Annual Groundwater Monitoring Report for the Goss Cove Landfill, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. August.

TtNUS, 2003d. Year 4 Groundwater Monitoring Report for DRMO, Naval Submarine Base – New London, Groton, Connecticut. King of Prussia, Pennsylvania. August.

TtNUS, 2004. Basewide Groundwater Operable Unit Remedial Investigation Update/Feasibility Study Report for Naval Submarine Base New London, Groton, Connecticut. King of Prussia, Pennsylvania. July.

TtNUS, 2005. Land Use Control (LUC) Remedial Design for Sites 3 and 7 Groundwater, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. June

TtNUS, 2006a Operations and Maintenance Manual for Installation Restoration Program Sites at Naval Submarine Base – New London, Groton, Connecticut. Volumes I, II, III, IV, and V. King of Prussia, Pennsylvania. January.

TtNUS, 2006b Work Plan for Remedial Action at Sites 3 and 7, Naval Submarine Base - New London, Groton, Connecticut. King of Prussia, Pennsylvania. March

USEPA (U.S. Environmental Protection Agency), 1986. Quality Criteria for Water 1986. Office of Water Regulations and Standards. Washington, D.C. EPA 440/5-86-001. May 1.

USEPA, 1989. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, D.C. EPA 540/1-89/002. December.

USEPA, 1991. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. Washington, D.C. OSWER Directive 9285.6-03. March 25, 1991.

USEPA, 1992a. Dermal Exposure Assessment: Principles and Applications. Interim Report. Office of Research and Development, Washington, DC, EPA/600/8-91/011B. January.

USEPA, 1992b. Framework for Ecological Risk Assessment. Washington, DC: Risk Assessment Forum; EPA/630/R-92/001.

USEPA, 1993a. Sediment Quality Criteria for the Protection of Benthic Organisms: Dieldrin. Office of Science and Technology, Health and Ecological Criteria Division, Office of Research and Development, EPA-822-R-93-015. September.

USEPA, 1993b. Wildlife Exposure Factors Handbook. Office of Research and Development. Washington, D.C., EPA/600/R-93/187a. December.

USEPA, 1994a. ECOSAR; Automated Program for Estimating the Environmental Toxicity of Industrial Chemicals. Version 1.01. Office of Pollution Prevention and Toxics. Washington, D.C.

USEPA, 1994b. Region I, Risk Updates, Number 2. Waste Management Division, Boston, Massachusetts. August

USEPA, 1994c. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Review Draft. September.

USEPA, 1995a. Federal Facility Agreement Under CERCLA 120, In the Matter of The US Department of the Navy, Naval Submarine Base – New London, Groton, Connecticut. January.

USEPA, 1995b. Region I, Risk Updates, Number 3. Waste Management Division, Boston, Massachusetts. August

USEPA, 1996a. ECO Update, Ecotox Thresholds. U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response. Intermittent Bulletin, Volume 3, Number 2, EPA540/F-95/038. January.

USEPA, 1996b. Region I, Risk Updates, Number 4. Waste Management Division, Boston, Massachusetts. November

USEPA, 1996c. Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills. Office of Solid Waste and Emergency Response, Directive No. 9355.0-67FS. EPA/540/F-96/020. December.

USEPA, 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. Interim Final. Environmental Response Team. June 5.

USEPA, 1999a. National Recommended Water Quality Criteria-Correction. Office of Water, EPA 822-Z-99-001. April.

USEPA, 1999b. Region I, Risk Updates, Number 5. Waste Management Division, Boston, Massachusetts. September

USEPA, 1999c. Draft Comprehensive Five-Year Review Guidance. Office of Emergency and Remedial Response, OSWER No. 9355.7-03B-P, EPA 540R-98-050. October.

USEPA, 2001a. Comprehensive Five-Year Review Guidance. Office of Emergency and Remedial Response, OSWER No. 9355.7-03B-P, EPA 540R-01-007. June.

USEPA, 2001b. Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual, Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments. Publication 9285.7-47, Office of Emergency and Remedial Response, Washington, D.C., December.

USEPA, 2002a. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance). EPA 530-D-02-004, November.

USEPA, 2002b Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response. OSWER Publication No. 9285.6-10. December.

USEPA, 2004a. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, (Part E, Supplemental Guidance for Dermal Risk Assessment), Final. EPA/540/R/99/005, Office of Emergency and Remedial Response, Washington, D.C., July.

USEPA, 2004b. 2004 Edition of the Drinking Water Standards and Health Advisories, EPA 822-B-04-005, Office of Water, Washington, D.C., Winter.

USEPA, 2005a. Guidance for Developing Ecological Soil Screening Level. Office of Solid Waste and Emergency and Response. OSWER Directive 92857-55. February.

USEPA, 2005b. Guidelines for Carcinogenic Risk Assessments. Risk Assessment Forum, EPA/630/P-03/001F, Washington, D.C., March.

USEPA, 2005c. Supplemental Guidance for Assessing Susceptibility from Early Life Exposure to Carcinogens Risk Assessment Forum. EPA/630/R-03/003F, Washington, D.C., March.

USEPA, 2006. National Recommended Water Quality Criteria. Office of Water, Washington, D.C.

Washington State, 1994. Creation of Freshwater Sediment Quality Database and Preliminary Analysis of Freshwater Apparent Effects Thresholds. Department of Ecology. Environmental Investigations and Laboratory Services Program, Toxics Investigations Section, Olympia, Washington Publication No. 97-323a. July.

Wehran (Wehran Engineering Corporation), 1987. Final Site Investigation of Subsurface Oil Contamination – Lower Subase, Naval Submarine Base, New London, Groton, Connecticut. Methuen, Massachusetts. November.

Will, M.E., and G.W. Suter, 1994. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants. Oak Ridge National Laboratory, Oak Ridge, TN.

#### **APPENDIX A**

### LANDFILL INSPECTION REPORT CHECKLISTS

- A.1 AREA A LANDFILL
- A.2 DRMO
- A.3 GOSS COVE LANDFILL

A.1 AREA A LANDFILL

[			,	INS	PEC	CTION CHECKLIST
OTTOR STABILITY, ONLY A AND A F			ð	dir	12-	AREA A LANDFILL
SITE NAME: Site 2 - Area A L EPA ID: CTD980906515	andfill (OU1)	_				
SITE LOCATION: New London	on County. CT					
EPA REGION: Region I		_				
REMEDY AT SITE: Landfill C	Cover, Instituti	iona	l Cor	<u>atrol</u>	<u>s, M</u> c	onitoring
DATE: 4-Jun-2003					•	
DATE: 4-Jun-2003 INSPECTOR/COMPANY	Tim Nichols	~ D !	e /p			
mor bot off contains	I IIII INCHOL	, E	<u> </u>	<u></u>		
WEATHER CONDITIONS:	Temperature:	x: _	•	62 <b>Œ</b>		
	Weather:	-		Rain		<del>-</del>
	Other:	:		NA		
TYPE OF INSPECTION:	■ Annual Insp	ti				
	Post-Major			Fver	ıt İnst	paction
	□ Re-Inspectio	on of	Def	icien/	t Item	as
	Other					
		<del>-</del>	<del></del>	Ties	٦	
	Ī			AIRS/MAINTENANCE RECOMMENDED	AIRS/MAINTENANCE	
	1	1	۲	LIRS/MAINTENAN RECOMMENDED	TEN.	
AREA OF INSPECTION	ואי ו		APP	AMI	AIN	NOTES AND COMMENTS
	<b>!</b>	CTE	NOT	RS/M	RS/M	
		NSPECTED	DOES NOT APPLY			
NSTRUMBURAL (CONTRACTOR		=	À	NO REP	R R	
1) Security Fencing				Ť	T	
a) Fencing Around Deployed Parking	- 4-00	=	0	-		Damaged fence sections at deployed parking area.
b) Entrance Gate to Deployed Parkin		=	0		0	
c) Fence Foundations in Deployed P		-		-	╁╤┤	None.
d) Entrance Gate at Thresher Road		-		-		None.
		-	0.			Gate not being secured.
e) Entrance Gate at Wahoo Avenue					1_	Gate not being secured.
f) No Trespassing and Security Signs			1-1			No signage with contact information.
g) Indications of Vandalism or Tresp	assing			<u> </u>		None.
SHIP AND THE SHIP						
2) Plateau Asphalt Cap Area	T					n de la companya de La companya de la co
			_	_	_	
a) General Condition of Asphalt Pave				<b>├</b> ──┤		General condition ok with exception of joint separation.
b) Level or Designed Slope Within Pa	uvement					None.
c) Cracks in Pavement		-				Significant cracks/ joint separation.
d) Erosion in Pavement or Adjacent A				-	_	None.
e) Holes/Penetrations in Asphalt Surfa				=		None.
f) Bulges in Asphalt Surface		-+	0	=		None.
g) Standing Water - other than above			0			None.
h) Stability of Slopes and Adjacent Are	eas	•		0	- \	Vegetated/grass area at west and south portions of the site not stabilized.
i) Groundwater Monitoring Well Pene	etrations	-	0	=	<b>0</b>	None.
j) Damage to Pavement Caused by Ar	rea A Use	-	0			Lack of surface protection for staged trailers, equipment, and materials.
k) Any Exposed Cap Components				•	-	None.
		T		$\Box$	$\top$	
		<del></del>				

# SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 2 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
3) Sideslope Riprap Cap Area					
a) General Condition of Riprap Protection			0	•	General condition is good except for invasive vegetation growth and minor wind-blown trash.
b) General Condition of Gabion Protection		0		-	See Item 3a.
c) Localized Depressions in Riprap	-	0	-	0	None.
d) Erosion in Riprap or Adjacent Areas	-	0	-		None.
e) Standing Water - other than above (c)	-	0	-	а	None.
f) Stability of Slopes and Adjacent Areas	-		=		None.
g) Groundwater Monitoring Well Penetrations	-		-	0	None.
h) Exposed Cap Components	-		-	0	None.
i) Presence of Leachate Seeps at Toe of Slope	-	0	0	-	Minor leachate breakouts observed at north toe/wetland.
4) Crane Test Pad	1	-			
a) General Condition of Concrete Pad	=	0	=	0	None.
b) Standing Water - other than above (a)			-	0	None.
State And Special And Service Assets Co.		5000 pa 2000 pa 1			
5) Drainage Channel A					
a) General Condition of Drainage Swale	-			-	Significant siltation, wind-blown trash, and invasive vegetation in swales.
b) Condition of Asphalt Channel Lining			=	0	Unable to inspect entire lining due to siltation and vegetation.
c) Siltation within Swale	-		۵		Significant siltation in channels.
d) Invasive Vegetation within Swale	-				Significant invasive vegetation growing in channels.
e) Localized Depressions or Heaving		0			
f) Condition of Culvert 1 Headwall					Unable to inspect entire lining due to siltation and vegetation.
			•		Unable to inspect entire lining due to siltation and vegetation. None.
g) Condition of Culvert 1 (Elliptical Pipe)		0			
g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall	=	<b></b>		<b>□</b> ■ 1	None.
	-	0		<b>□</b> ■ 1	None. Sedimentation in culvert.
h) Condition of Culvert 1 Endwall	•	0	□ ■		None. Sedimentation in culvert. None.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall	=	0 0			None. Sedimentation in culvert. None. None.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe)	=	0 0 0 0			None. Sedimentation in culvert. None. None. Sedimentation in culvert.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe)	=	0 0 0 0			None. Sedimentation in culvert. None. None. Sedimentation in culvert.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall	=	0 0 0 0			None. Sedimentation in culvert. None. None. Sedimentation in culvert.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  6) Drainage Channel B	=======================================	0 0 0 0			None. Sedimentation in culvert. None. None. Sedimentation in culvert. None.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  6) Drainage Channel B a) General Condition of Drainage Swale		0 0 0 0 0			None. Sedimentation in culvert. None. Sedimentation in culvert. None. Sedimentation in culvert. None.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining		0 0 0 0			None. Sedimentation in culvert. None. Sedimentation in culvert. Sedimentation in culvert. None. Significant siltation and invasive vegetation in west end of channel. Unable to inspect entire lining due to siltation and vegetation.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale					None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Significant siltation and invasive vegetation in west end of channel.  Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in west end of channel.
h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale					None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Significant siltation and invasive vegetation in west end of channel.  Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in west end of channel.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
7) Drainage Channel C					
a) General Condition of Drainage Swale	•		0	-	Significant siltation and invasive vegetation in riprap channel.
b) Condition of Riprap Lining	=		-	0	Unable to inspect entire lining due to siltation and vegetation.
c) Siltation within Swale	-		0	-	Significant siltation in channel riprap.
d) Invasive Vegetation within Swale	-		0	-	Significant invasive vegetation growing in channels.
e) Localized Depressions or Heaving	_		•		None.
f) Condition of Culvert Under Parking Entrance	-		-	0	None.
	<u> </u>				
8) Drainage Channel D	_	l			
a) General Condition of Drainage Swale	-	0	-	0	Channel is in good condition - low flow channel.
b) Condition of Channel Lining	-	0	-	0	None.
c) Siltation within Swale	-	0	-		None.
d) Invasive Vegetation within Swale	-		-		None.
e) Localized Depressions or Heaving	-	-	-		None.
0) Projecto Characl F	-	-	-		
9) Drainage Channel E		_	_	=	·
a) General Condition of Drainage Swale b) Condition of Channel Lining	_		]	-	Significant siltation and invasive vegetation in channel.
c) Siltation within Swale	_	_	_		None.
d) Invasive Vegetation within Swale	-			_	Significant siltation in channel.
e) Localized Depressions or Heaving			-	_	Significant invasive vegetation growing in channel.  None.
by socuraca Bepressions of Heaving					None.
		142	Man.		
10) GVR-1					
a) Condition of Gas Vent Riser			•		None.
b) Condition of End Section - 90 Degree Elbows		0	-		None.
c) Condition of Riser Protection (HDPE Pipe)	=	0	=		None.
d) Condition of Concrete Barriers Around Riser	=	_	-	0	None.
11) GVR-2			Ì		
a) Condition of Gas Vent Riser			-	_	None.
b) Condition of End Section - 90 Degree Elbows	-				None.
c) Condition of Riser Protection (HDPE Pipe)	=		-		None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
12) GVR-3	<u>_</u>	_	_		
a) Condition of Gas Vent Riser	-	_	-		None.
b) Condition of End Section - 90 Degree Elbows	-	_	-		None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser	-	_	-	_	None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
13) GVR-4					
a) Condition of Gas Vent Riser	•	0	=	0	None.
b) Condition of End Section - 90 Degree Elbows	•	0	-		None.
c) Condition of Riser Protection (HDPE Pipe)	=	0	-	0	None.
d) Condition of Concrete Barriers Around Riser	-	0	-	0	None.
				ļ	
14) GVR-5	_	_	_		
a) Condition of Gas Vent Riser	-	0		0	None.
b) Condition of End Section - 90 Degree Elbows	=	0	_	-	None.
c) Condition of Riser Protection (HDPE Pipe)		0	-	<del> -</del> -	None.
d) Condition of Concrete Barriers Around Riser	_	_	<del>                                     </del>		None.
15) GVR-6	-				
a) Condition of Gas Vent Riser		_	-	_	None.
b) Condition of End Section - 90 Degree Elbows	-	_	•		None.
c) Condition of Riser Protection (HDPE Pipe)	-	П			None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
16) GVR-7					
a) Condition of Gas Vent Riser	-		•		None.
b) Condition of End Section - 90 Degree Elbows	•	0	•	0	None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser	•	0	•		None.
17) GVR-8					
a) Condition of Gas Vent Riser	-	0	-	0	None.
b) Condition of End Section - 90 Degree Elbows	-		-		None.
c) Condition of Riser Protection (HDPE Pipe)		_	•		None.
d) Condition of Concrete Barriers Around Riser					None.
		-			
18) GVR-9		_		_	
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-		-	<u> </u>	None.
c) Condition of Riser Protection (HDPE Pipe)			_	0	None.
d) Condition of Concrete Barriers Around Riser		-	⊢		None.
19) GVR-10		_	$\vdash$		
a) Condition of Gas Vent Riser			-	_	None.
b) Condition of End Section - 90 Degree Elbows	-		-		None.
c) Condition of Riser Protection (HDPE Pipe)			•		None.
d) Condition of Concrete Barriers Around Riser	-		-	0	None.
To Sometime of Sometime Daniers Atomia Alser					TOTAL
		<u> </u>			

#### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 5 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
20) GVR-11					
a) Condition of Gas Vent Riser	-		-	0	None.
b) Condition of End Section - 90 Degree Elbows	-	0	-	0	None.
c) Condition of Riser Protection (HDPE Pipe)	•		=	Π.	None.
d) Condition of Concrete Barriers Around Riser	-		-	0	None.
				<u> </u>	
21) GVR-12		-			
a) Condition of Gas Vent Riser	-	0	-	0	None.
b) Condition of End Section - 90 Degree Elbows	-	0	-	0	None.
c) Condition of Riser Protection (HDPE Pipe)	-	_	_	_	None.
d) Condition of Concrete Barriers Around Riser	=		-		None.
•	<u> </u>	_		-	
22) GVR-13				_	
a) Condition of Gas Vent Riser	-	0		0	None.
b) Condition of End Section - 90 Degree Elbows		0	-	-	None.
c) Condition of Riser Protection (HDPE Pipe)		0		0	None.
d) Condition of Concrete Barriers Around Riser	-	L	-		None.
22) CVD 14	_			-	
23) GVR-14  a) Condition of Gas Vent Riser		0	-	_	N
b) Condition of End Section - 90 Degree Elbows			-		None.
c) Condition of Riser Protection (HDPE Pipe)	-	-	•	-	None.
d) Condition of Concrete Barriers Around Riser	-				None.
ay condition by concrete burners around reser					Note:
24) GVR-15					
a) Condition of Gas Vent Riser	-	0			None.
b) Condition of End Section - 90 Degree Elbows	•		•		None.
c) Condition of Riser Protection (HDPE Pipe)	-	_	•		None.
d) Condition of Concrete Barriers Around Riser	-	0	-		None.
25) GVR-16					
a) Condition of Gas Vent Riser	•		=	0	None.
b) Condition of End Section - 90 Degree Elbows	-				None.
c) Condition of Riser Protection (HDPE Pipe)				0	None.
d) Condition of Concrete Barriers Around Riser		П	•	О	None.
26) GVR-17					
a) Condition of Gas Vent Riser	-	0	-		None.
b) Condition of End Section - 90 Degree Elbows	•		-	Image: control in the	None.
c) Condition of Riser Protection (HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser		<b>□</b>			None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
27) GVR-18					
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-			0	None.
c) Condition of Riser Protection (HDPE Pipe)	-		•	0	None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
	_			<u> </u>	
28) GVR-19	_ :	_	_	l_	
a) Condition of Gas Vent Riser	-	0			None.
b) Condition of End Section - 90 Degree Elbows	-	0	-		None.
c) Condition of Riser Protection (HDPE Pipe)	=	0	_	_	None.
d) Condition of Concrete Barriers Around Riser	=		-		None.
an cum as		-		-	
29) GVR-20	_		_		
a) Condition of Gas Vent Riser	_		_	0	None.
b) Condition of End Section - 90 Degree Elbows	-	_		0	None.
c) Condition of Riser Protection (HDPE Pipe)	_	0		-	None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
30) GVR-21					
a) Condition of Gas Vent Riser	•	_	-		None.
b) Condition of End Section - 90 Degree Elbows	•	_	-		None.
c) Condition of Riser Protection (HDPE Pipe)	-		=		None.
d) Condition of Concrete Barriers Around Riser	=		-		None,
31) GVR-22					
a) Condition of Gas Vent Riser	-	0	=		None.
b) Condition of End Section - 90 Degree Elbows	•				None.
c) Condition of Riser Protection (HDPE Pipe)			-		None.
d) Condition of Concrete Barriers Around Riser	-		-		Barriers pushed into asphalt curb (minor damage).
32) GVR-23					
a) Condition of Gas Vent Riser	=		-	0	None.
b) Condition of End Section - 90 Degree Elbows	=		•		None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser			•		None.
33) GVR-24					
a) Condition of Gas Vent Riser	•		-		None.
b) Condition of End Section - 90 Degree Elbows	=	0	-		None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser	-		-	0	None.

#### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 7 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) GVR-25		_	_	_	
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-	0	-		None.
c) Condition of Riser Protection (HDPE Pipe)	<u> </u>	0	-	0	None.
d) Condition of Concrete Barriers Around Riser	┞-		-		None.
	-				
35) GVR-26	_	_	_	_	
a) Condition of Gas Vent Riser	-	-	_	0	None.
b) Condition of End Section - 90 Degree Elbows		0	_		None.
c) Condition of Riser Protection (HDPE Pipe)	-	0	_	_	None.
d) Condition of Concrete Barriers Around Riser	-	0	-		None.
	<u> </u>	<u> </u>		_	
36) GVR-27	_	_		_	
a) Condition of Gas Vent Riser		0	-		None.
b) Condition of End Section - 90 Degree Elbows	-	_	_		None.
c) Condition of Riser Protection (HDPE Pipe)			-		None.
d) Condition of Concrete Barriers Around Riser	-	0	-		None.
	(7) (7)	agree in		37.975	
37) 1MW2S		A. 250.			
a) Condition of Surface Surrounding Well Cover				0	None.
b) Condition of Flush Mount Well Cover		_	-		None.
c) Condition of Well Lock		_	-		None.
c) Condition by well book					None.
38) 2LMW7S					
a) Condition of Surface Surrounding Well Cover	-	_	_	_	Mana
b) Condition of Flush Mount Well Cover	-	0			None.
c) Condition of Well Lock					None.
cy Conumon by wen bock					NOIG.
39) 2LMW7D					
a) Condition of Surface Surrounding Well Cover	-	0	-	0	None.
b) Condition of Flush Mount Well Cover	•		Ė		None.
c) Condition of Well Lock		0	-		
y Common of their book					None.
40) 2LMW8S					
	=	D	=	0	None
a) Condition of Surface Surrounding Well Cover			-	_	None.
a) Condition of Surface Surrounding Well Cover					None
a) Condition of Surface Surrounding Well Cover b) Condition of Flush Mount Well Cover c) Condition of Well Lock	-	0	=		None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
41) 2LMW8D					
a) Condition of Surface Surrounding Well Cover	-	0	-	0	None.
b) Condition of Flush Mount Well Cover	-		-	0	None.
c) Condition of Well Lock	<u> </u>				None.
	ļ				
42) 2LMW9D					
a) Condition of Surface Surrounding Well Cover	-	0	-		None.
b) Condition of Flush Mount Well Cover	-	0	-		None.
c) Condition of Well Lock			-		None.
		_	_	-	
43) 2LMW13S	_				
a) Condition of Surface Surrounding Well Cover		0	-		None.
b) Condition of Flush Mount Well Cover	-	0	-		None.
c) Condition of Well Lock	-		-		None.
			<u> </u>		
44) 2LMW13D					
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover		0	-		None.
c) Condition of Well Lock	-	0			None.
			-		
45) 2LMW14D	_	_	-	_	
a) Condition of Surface Surrounding Well Cover	_				None.
b) Condition of Flush Mount Well Cover	_	0	-		None.
c) Condition of Well Lock	-	-	_		None.
40 44 1044					
46) 2LMW17S	_		-	_	
a) Condition of Surface Surrounding Well Cover		0	_	<u>-</u>	None.
b) Condition of Flush Mount Well Cover	_	_			None.
c) Condition of Well Lock	_	Ë	_	_	None.
47) 2LMW17D					
	_			0	N
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover		_			None.
c) Condition of Well Lock	-	_			None.
48) 2LMW18S					
	-	_	_		Mana
a) Condition of Surface Surrounding Well Cover		0	_		None.
b) Condition of Flush Mount Well Cover	_	į.	_	_	None.
c) Condition of Well Lock	-	, 1		_	None.
<u> </u>	L	لِللا	لـــــا		

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
49) 2LMW18D					
a) Condition of Surface Surrounding Well Cover	╚		-		None.
b) Condition of Flush Mount Well Cover	-	0	•	0	None.
c) Condition of Well Lock	=		=	0	None.
	lacksquare	_		<u> </u>	
50) 2LMW19S					
a) Condition of Protective Casing	-	D	-		None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock	-		-		None.
d) Condition of Well Protection - Bollards	-		-	0	None.
CI) OI ACUMOD	-	-		_	
51) 2LMW19D		0	-		
a) Condition of Protective Casing	_		-	0	None.
b) Condition of Well Love		-	_	_	None.
c) Condition of Well Lock d) Condition of Well Protection - Bollards					None.
dy Condition of Weil Protection - Bollaras	干	<del> </del>	-	_	None.
52) 2LMW20S	一				
a) Condition of Protective Casing	-			0	None
b) Condition of Well Cover	-		-	_	None.
c) Condition of Well Lock	-	0	-		None.
d) Condition of Well Protection - Bollards	•		-		None.
53) 2LMW20D					
a) Condition of Protective Casing	-	0	-	0	None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock	-		•		None.
d) Condition of Well Protection - Bollards	-	0	<b>#</b>		None.
54) 3MW12D (Abandoned/Replaced)					
a) Condition of Protective Casing	-		-	0	None.
b) Condition of Well Cover	•		=		None.
c) Condition of Well Lock	-		-	0	None.
d) Condition of Well Protection - Bollards	-				None.
· · · · · · · · · · · · · · · · · · ·			_		
55) 2WMW21S					
a) Condition of Protective Casing	-				None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock	-		-		None.
d) Condition of Well Protection - Bollards	-	0	-		None.
				l	

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
56) 2WMW21D					
a) Condition of Protective Casing	-		-	0	None.
b) Condition of Well Cover	-		_		None.
c) Condition of Well Lock	-		_	0	None.
d) Condition of Well Protection - Bollards	-	0	┖		None.
		<u> </u>			
57) 2WMW3S					
a) Condition of Protective Casing			-		None.
b) Condition of Well Cover	-				None.
c) Condition of Well Lock	-		-		None.
d) Condition of Well Protection - Bollards	-		-		None.
	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
58) 2WMW3D	1				·
a) Condition of Protective Casing	-	0			None.
b) Condition of Well Cover		<u> </u>	-		None.
c) Condition of Well Lock	-	<u> </u>	-		None.
d) Condition of Well Protection - Bollards	-		-		None.
	<u> </u>	<u> </u>	ļ		
59) 2LOWIS	<u> </u>	_	_	_	
a) Condition of Surface Surrounding Well Cover	-	<u> </u>		0	None.
b) Condition of Flush Mount Well Cover	-		-	0	None.
c) Condition of Well Lock	-		-		None.
		<u> </u>	-	_	
60) 2LOWID	l_		_	_	
a) Condition of Surface Surrounding Well Cover	-	0	-		None.
b) Condition of Flush Mount Well Cover	-	0	-	0	None.
c) Condition of Well Lock	-	-	-	-	None.
	┝	-	-	-	
61) 2LOW2S	_		_	_'	
a) Condition of Surface Surrounding Well Cover		0	-	-	None.
b) Condition of Flush Mount Well Cover	-	<u>-</u>	-	<u>-</u>	None.
c) Condition of Well Lock	-		-		None.
				-	
62) 2LOW3S	l_		_	_	
a) Condition of Surface Surrounding Well Cover		0	_	<u>-</u>	None.
b) Condition of Flush Mount Well Cover	-	<u>-</u>	_	0	None.
c) Condition of Well Lock	-	0	-	0	None.
	<u> </u>	-		<del> </del>	
63) 2LOW4S	_		_	_	
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover	-	<u> </u>	-	_	None.
c) Condition of Well Lock	-		-		None.
			<u> </u>		

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
64) 2LPW1S					
a) Condition of Surface Surrounding Well Cover	•	0	-	0	None.
b) Condition of Flush Mount Well Cover	=		=		None.
c) Condition of Well Lock	-	0	-		None.
65) 2LMW28DS	_	_	_	_	
a) Condition of Surface Surrounding Well Cover	_		-	_	None.
b) Condition of Flush Mount Well Cover			_		None.
c) Condition of Well Lock	=		-		None.
66) 2LMW28F			_	_	
a) Condition of Surface Surrounding Well Cover	•	0	-		None.
b) Condition of Flush Mount Well Cover		0	-		None.
c) Condition of Well Lock	-		-	0	None.
				<u> </u>	
67) 2LMW29A		0	_	0	
a) Condition of Surface Surrounding Well Cover	-	0	-	0	None.
b) Condition of Flush Mount Well Cover	-	-	_	0	None.
c) Condition of Well Lock		_		F	None.
CON 21 MANAGE					
68) 2LMW29F				0	Mana
a) Condition of Surface Surrounding Well Cover				-	None.
b) Condition of Flush Mount Well Cover				_	None.
c) Condition of Well Lock			-	<u> </u>	None.
69) 2LMW30DS				<del>  -</del>	
a) Condition of Surface Surrounding Well Cover	-	0	_	_	None.
b) Condition of Flush Mount Well Cover	-	0	-	_	None.
c) Condition of Well Lock			-	0	None.
					, , , , , , , , , , , , , , , , , , , ,
70) 2LMW30F					
a) Condition of Surface Surrounding Well Cover	-	0	=	0	None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock	-		-		None.
,					
71) 2LMW31DS					
a) Condition of Surface Surrounding Well Cover	=	О	=	_	None.
b) Condition of Flush Mount Well Cover	-	_	-	0	None.
c) Condition of Well Lock			-		None.

#### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 12 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
72) 2LMW32DS					
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover	-		-	0	None.
c) Condition of Well Lock	-		-	<u> </u>	None.
				<u> </u>	
73) 2LMW32F					
a) Condition of Surface Surrounding Well Cover	-		-	0	None.
b) Condition of Flush Mount Well Cover	-		-	_	None.
c) Condition of Well Lock	-	0	-		None.
· · · · · · · · · · · · · · · · · · ·			-	-	
74) 2LMW32B	_	_	_		
a) Condition of Surface Surrounding Well Cover	-			-	None.
b) Condition of Flush Mount Well Cover	-	0	-	-	None.
c) Condition of Well Lock	┡	H	-	-	None.
75) 2MW22DC	-			$\vdash$	
75) 2MW33DS	-	_			Na
a) Condition of Surface Surrounding Well Cover		-		-	None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock			┢	<del>                                     </del>	Note.
76) 2LMW33F			<b>-</b>		
a) Condition of Surface Surrounding Well Cover	-	0	-		None.
b) Condition of Flush Mount Well Cover	=	0	=		None.
c) Condition of Well Lock	-		=	0	None.
77) 2LMW34DS					·
a) Condition of Surface Surrounding Well Cover	-	0	-	_	None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock	-	0	-	0	None.
	_		<u> </u>	_	
78) 2WMW38DS					
a) Condition of Protective Casing	-	<u>-</u>	-	<u> </u>	None.
b) Condition of Well Cover	-		_	<u> </u>	None.
c) Condition of Well Lock	=	0	-		None.
d) Condition of Well Protection - Bollards	-	0			None.
·	<u> </u>	<u> </u>	$\vdash$	1	
79) 2WMW39DS	_	_	_		
a) Condition of Protective Casing	-		-		None.
b) Condition of Well Cover	-	0	-	<u>                                     </u>	None.
c) Condition of Well Lock	-	0	-	<u> </u>	None.
d) Condition of Well Protection - Bollards	-		-		None.
	ŀ		1		

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
80) 2WMW40DS					
a) Condition of Protective Casing	■	0	-	0	None.
b) Condition of Well Cover	▮≞		-	0	None.
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards	-		=		None.
	↓_	ļ			
81) 2WMW41DS	-				
a) Condition of Protective Casing	-		-	0	None.
b) Condition of Well Cover	-			0	None.
c) Condition of Well Lock			-		None.
d) Condition of Well Protection - Bollards	-	_	=	0	None.
	-			<u> </u>	
82) 2WMW42DS	<b> </b> _	_	_	_	
a) Condition of Protective Casing	-				None.
b) Condition of Well Cover	-				None.
c) Condition of Well Lock	-		-	0	None.
d) Condition of Well Protection - Bollards	-		-		None.
	-				
83) 2WMW43DS				_	
a) Condition of Protective Casing			-		None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock		0		]	None.
d) Condition of Well Protection - Bollards	<del>  -</del>	-	-		None.
84) 2WMW44DS					
			_	_	
a) Condition of Protective Casing b) Condition of Well Cover	-		_	_	None.
c) Condition of Well Lock			-		None.
		_			None.
d) Condition of Well Protection - Bollards			-	-	None.
85) 2WMW45DS	$\vdash$	$\dashv$	_	-	
a) Condition of Protective Casing	_				None
b) Condition of Well Cover		-	_		None.
c) Condition of Well Lock			-		None.
d) Condition of Well Protection - Bollards		_		_	None.
John Maria		_	$\neg +$		ITO ID.
86) 2WMW46DS	$\vdash$		$\neg \dagger$	$\dashv$	
a) Condition of Protective Casing	-				None
b) Condition of Well Cover	-		•		None.
c) Condition of Well Lock	•		-	$\exists$	None.
d) Condition of Well Protection - Bollards	•		-	_	None.
	$\vdash$		-	_	INUITG.

#### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 14 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
87) 2WMW47DS					
a) Condition of Protective Casing	=	_	=		None.
b) Condition of Well Cover	-		=		None.
c) Condition of Well Lock		0		0	None.
d) Condition of Well Protection - Bollards	=	0	-		None.
88) 3MW37S					
a) Condition of Protective Casing	-	0		0	None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock	•	_	=		None.
d) Condition of Well Protection - Bollards	-		-		None.
89) 4MW1S					
a) Condition of Protective Casing	•	0	=		None.
b) Condition of Well Cover	•	0			None.
c) Condition of Well Lock		0		0	None.
d) Condition of Well Protection - Bollards	-		-	0	None.

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-	nacy of O&M at Site: is issues and observations related to the implementation and scope of O&M pr (-)	rocedures. In particular, di	scuss their relationship to the co	arrent and long-term protecti	veness of the
	eral, the landfill cap system is in fair condition and is functioning as d be addressed this construction season. The maintenance items and o				
		-			
r					
Notes:	: ss and clarify any comments or observations related to this inspection.)				
	and oming any commence of coost rations I cured to this inspection.)				
None.					
		•			
					•
		·	· ·		
	encies/Items Requiring Corrections; is all items that were deficient during the inspection. Also provide recommen	dations for the deficient iter	ns - such as continued monitori	ng and inspection or repair an	d further remedial
action.					
See at	tached Deficiency Log (Table 1-1) for noted deficiencies and recomm	nended corrective actions			
			· .		
	Timeshar D. Mishala D.D.				
	Timothy D. Nichols, P.E. Printed Name of Inspector		Signature of Ins	pector / Date	
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
I heret	fication Statement: by certify that a complete and through inspection and evaluation of the site and d with respect to the intent of the implemented remedy and the remedial action			ems noted on this inspection fo	rm have been
	Printed Name of O&M Engineer		Printed Name of NSB-I	NLON IRP Manager	
	Signature of O&M Engineer / Date		Signature of NSB-NLON	I IRP Manager / Date	

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Provide additional notes or sketch of site as needed:	
See attached site map (Figure 1-1).	
	•

			ĪN	SPE	₹ <b>C</b> ′	TION CHECKLIST					
	SITE 2 - AREA A LANDFILL										
SITE NAME: Site 2 - Area A Landfill	A (OU1)										
EPA ID: CTD980906515											
SITE LOCATION: New London Cour	nty, CT										
EPA REGION: <u>Region I</u> REMEDY AT SITE: <u>Landfill Cover, l</u>	*titutio	~~! C		-la h	40	• • •					
KEMEDI AI SHE. Lanum Cover, i	INSTITUTE	<u>iai Cu</u>	ntro	IS, iv	<u>10u</u>	attoring					
DATE: 4-Jun-2003				•							
INSPECTOR/COMPANY Tim	n Nichols, I	P.E. /	ECC	<u>;</u>							
Total Company on Total			<b>10</b> F	_							
•	nperature: _ Weather:		62 E								
	Weather: Other:		Rain NA			<del>-</del>					
	· · · · · ·		174.								
	nual Inspec										
□ Post	st-Major W	Veather									
	-Inspection	of De	ficie	nt Ite	ms	3					
□ Oth	.er										
					_						
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		<u>ح</u> ا	YTE Y	NTE	<u>.</u> 8						
AREA OF INSPECTION	1	9 4	4 4	MAIN	. GI	NOTES AND COMMENTS					
	1	ğ   ş	IRS	RECOMMENDED IRS/MAINTENAN	WW						
	1	INSPECTED DOES NOT APPLY		NOT RECOMMENDED REPAIRS/MAINTENANCE	ပ္သု						
INSTITUTERINAL CONTROLS			12	ŽIE	衞						
1) Security Fencing											
a) Fencing Around Deployed Parking Area	_	• 0	-   c	3   r	_	Damaged fence sections at deployed parking area.					
b) Entrance Gate to Deployed Parking Area	-	<b>a</b> 0		<del></del>	$\exists +$	None.					
c) Fence Foundations in Deployed Parking	u				<del>_  </del>	None.					
d) Entrance Gate at Thresher Road	Area										
						Gate not being secured.					
e) Entrance Gate at Wahoo Avenue					_+	Gate not being secured.					
f) No Trespassing and Security Signs						No signage with contact information.					
g) Indications of Vandalism or Trespassing		4-	+	- 0	<u>-</u>	None.					
CAPAREAS*	$\leftarrow$ $+$	4	4	4	4						
2) Plateau Asphalt Cap Area	1.,	.   _	_								
a) General Condition of Asphalt Pavement				-	-10	General condition ok with exception of joint separation.					
b) Level or Designed Slope Within Pavement				+-	''	None.					
c) Cracks in Pavement			+		- 3	Significant cracks/ joint separation.					
d) Erosion in Pavement or Adjacent Areas	-		) =		1	None.					
e) Holes/Penetrations in Asphalt Surface	-	• 0	•	0	1	None.					
f) Bulges in Asphalt Surface	•		-	0	7	None.					
g) Standing Water - other than above (b)		0	-	0	<u>.                                     </u>	None.					
h) Stability of Slopes and Adjacent Areas	-	• o	0	3 =	_	Vegetated/grass area at west and south portions of the site not stabilized.					
i) Groundwater Monitoring Well Penetration	ons =	• 0	-	, 0	1	None.					
j) Damage to Pavement Caused by Area A U			-		-   ``						
k) Any Exposed Cap Components	Use		+-		<del>,  ''</del>	Lack of surface protection for staged trailers, equipment, and materials.					
ty Any Exposed Cup Components		+	+	+	+	None.					
	1	- 1	1	1	-1						

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	_	_	_	,	
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
2) Sideslane Dinner Con Area				_	
3) Sideslope Riprap Cap Area				_	
a) General Condition of Riprap Protection	$\vdash$		├	-	General condition is good except for invasive vegetation growth and minor wind-blown trash.
b) General Condition of Gabion Protection	-	_	_	-	See Item 3a.
c) Localized Depressions in Riprap	-	_	_		None.
d) Erosion in Riprap or Adjacent Areas	-		•	0	None.
e) Standing Water - other than above (c)	-		-		None.
f) Stability of Slopes and Adjacent Areas	-		•		None.
g) Groundwater Monitoring Well Penetrations					None.
h) Exposed Cap Components					None.
i) Presence of Leachate Seeps at Toe of Slope	-		0	•	Minor leachate breakouts observed at north toe/wetland.
4) Crane Test Pad					
a) General Condition of Concrete Pad	-			_	None.
b) Standing Water - other than above (a)	-		-		None.
STORM WATER REATURES			469.55E		
				титания	annoniaminan alaan maanaan ahaan
	romanon	numanay.			
5) Drainage Channel A		Ö			Significant siltation wind blown trach and invasive vegetation in swales
5) Drainage Channel A  a) General Condition of Drainage Swale		0			Significant siltation, wind-blown trash, and invasive vegetation in swales.
5) Drainage Channel A  a) General Condition of Drainage Swale  b) Condition of Asphalt Channel Lining	$\vdash$		•	<b>-</b>	Unable to inspect entire lining due to siltation and vegetation.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale	-	0	<b>■</b>		Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.
5) Drainage Channel A  a) General Condition of Drainage Swale  b) Condition of Asphalt Channel Lining  c) Siltation within Swale  d) Invasive Vegetation within Swale					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.
5) Drainage Channel A  a) General Condition of Drainage Swale  b) Condition of Asphalt Channel Lining  c) Siltation within Swale  d) Invasive Vegetation within Swale  e) Localized Depressions or Heaving	-	0 0 0			Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.
5) Drainage Channel A  a) General Condition of Drainage Swale  b) Condition of Asphalt Channel Lining  c) Siltation within Swale  d) Invasive Vegetation within Swale  e) Localized Depressions or Heaving  f) Condition of Culvert 1 Headwall					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe)					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe)					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe)					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe)					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 2 Headwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 (Elliptical Pipe)					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 2 Headwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.
5) Drainage Channel A  a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 2 Headwall j) Condition of Culvert 2 (Elliptical Pipe) k) Condition of Culvert 2 Endwall  j) Condition of Culvert 2 Endwall  6) Drainage Channel B a) General Condition of Drainage Swale					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  Significant siltation and invasive vegetation in west end of channel.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 2 Headwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 Endwall j) Condition of Culvert 2 Endwall 6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Significant siltation and invasive vegetation in west end of channel.  Unable to inspect entire lining due to siltation and vegetation.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 (Elliptical Pipe) h) Condition of Culvert 2 Headwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 Endwall b) Condition of Culvert 2 Endwall 6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Significant siltation and invasive vegetation in west end of channel.  Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in west end of channel.
5) Drainage Channel A a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale e) Localized Depressions or Heaving f) Condition of Culvert 1 Headwall g) Condition of Culvert 1 Endwall i) Condition of Culvert 2 Headwall j) Condition of Culvert 2 Headwall j) Condition of Culvert 2 Endwall 6) Drainage Channel B a) General Condition of Drainage Swale b) Condition of Asphalt Channel Lining c) Siltation within Swale d) Invasive Vegetation within Swale					Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in channels.  Significant invasive vegetation growing in channels.  Unable to inspect entire lining due to siltation and vegetation.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Sedimentation in culvert.  None.  Significant siltation and invasive vegetation in west end of channel.  Unable to inspect entire lining due to siltation and vegetation.  Significant siltation in west end of channel.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
7) Drainage Channel C					
a) General Condition of Drainage Swale	-	0		_	Significant siltation and invasive vegetation in riprap channel.
b) Condition of Riprap Lining	-		-		Unable to inspect entire lining due to siltation and vegetation.
c) Siltation within Swale		ㅁ			Significant siltation in channel riprap.
d) Invasive Vegetation within Swale	•			-	Significant invasive vegetation growing in channels.
e) Localized Depressions or Heaving	•				None.
f) Condition of Culvert Under Parking Entrance	-				None.
8) Drainage Channel D				į	
a) General Condition of Drainage Swale	•	0	•		Channel is in good condition - low flow channel.
b) Condition of Channel Lining	-		-		None.
c) Siltation within Swale	•		-		None.
d) Invasive Vegetation within Swale	=				None.
e) Localized Depressions or Heaving	•		-		None.
9) Drainage Channel E					
a) General Condition of Drainage Swale	•			-	Significant siltation and invasive vegetation in channel.
b) Condition of Channel Lining	•			0	None.
c) Siltation within Swale	•			-	Significant siltation in channel.
d) Invasive Vegetation within Swale					Significant invasive vegetation growing in channel.
e) Localized Depressions or Heaving	-	_			None.
e) Localized Depressions of Heaving		<b>-</b>		1	TOTE.
GASTENTS					
10) GVR-1					
a) Condition of Gas Vent Riser			-	_	None.
b) Condition of End Section - 90 Degree Elbows	•			0	None.
c) Condition of Riser Protection (HDPE Pipe)			-	0	None.
d) Condition of Concrete Barriers Around Riser	•	_	•	0	None.
11) GVR-2					
a) Condition of Gas Vent Riser	-		=		None.
b) Condition of End Section - 90 Degree Elbows		_	-	_	None.
c) Condition of Riser Protection (HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	<del> </del> -	<del> </del>	<del>                                     </del>	<del> </del> -	None.
12) CVP 2	$\vdash$		+-		
12) GVR-3	_			_	<b></b>
a) Condition of Gas Vent Riser	-		▐	0	None.
b) Condition of End Section - 90 Degree Elbows	-	<del>  -</del>		-	None.
c) Condition of Riser Protection (HDPE Pipe)	┼_	-	-		None.
d) Condition of Concrete Barriers Around Riser	-	∺	╀	⊣	None.
.*	1	1	1	1	

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
13) GVR-4					
a) Condition of Gas Vent Riser	•		-		None.
b) Condition of End Section - 90 Degree Elbows			-		None.
c) Condition of Riser Protection (HDPE Pipe)	-				None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
	<u> </u>	<u> </u>	<u> </u>		•
14) GVR-5	_				
a) Condition of Gas Vent Riser		<u> </u>			None.
b) Condition of End Section - 90 Degree Elbows	-	-			None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser	-	-	<b>-</b>		None.
15 CVD (					
15) GVR-6 a) Condition of Gas Vent Riser				0	Na-a
b) Condition of End Section - 90 Degree Elbows		0		_	None.
c) Condition of Riser Protection (HDPE Pipe)				_	None.
d) Condition of Concrete Barriers Around Riser	-			_	None.
a) Common of Concrete Barriers Around Riser					NOTE.
16) GVR-7					
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	•	0	=	]	None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser			•		None.
17) GVR-8					
a) Condition of Gas Vent Riser	•		-	_	None.
b) Condition of End Section - 90 Degree Elbows			•		None.
c) Condition of Riser Protection (HDPE Pipe)	-		•	0	None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
18) GVR-9	_	_	_	_	
a) Condition of Gas Vent Riser					None.
b) Condition of End Section - 90 Degree Elbows	-		-	$\overline{}$	None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
19) GVR-10		_	_	إي	
a) Condition of Gas Vent Riser	-				None.
b) Condition of End Section - 90 Degree Elbows	-			_	None.
c) Condition of Riser Protection (HDPE Pipe)	-	-			None.
d) Condition of Concrete Barriers Around Riser	┢═╢		-	_	None.
	L :				

#### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 5 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
20) GVR-11	1_		۱_	_	
a) Condition of Gas Vent Riser			-	<u>-</u>	None.
b) Condition of End Section - 90 Degree Elbows	-	-	-	<u>-</u>	None.
c) Condition of Riser Protection (HDPE Pipe)	╁	-			None.
d) Condition of Concrete Barriers Around Riser	╀	-	-		None.
21) GVR-12					
a) Condition of Gas Vent Riser	=	0			None.
b) Condition of End Section - 90 Degree Elbows			-		None.
c) Condition of Riser Protection (HDPE Pipe)	•	0	-		None.
d) Condition of Concrete Barriers Around Riser	-		-	ㅁ	None.
	<u> </u>	_			
22) GVR-13					
a) Condition of Gas Vent Riser	-	<u> </u>	_		None.
b) Condition of End Section - 90 Degree Elbows	<u> </u>		_		None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser			-		None.
23) GVR-14	-				
a) Condition of Gas Vent Riser	=	_	-	_	None.
b) Condition of End Section - 90 Degree Elbows	•		-	]	None.
c) Condition of Riser Protection (HDPE Pipe)	-				None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
24) GVR-15					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows			_	_	None.
c) Condition of Riser Protection (HDPE Pipe)			_		None.
d) Condition of Concrete Barriers Around Riser					None.
a) Common of Concrese Burners Around Riser			_		None.
25) GVR-16					
a) Condition of Gas Vent Riser		_	=	ㅁ	None.
b) Condition of End Section - 90 Degree Elbows	•	_	_		None.
c) Condition of Riser Protection (HDPE Pipe)	•		=		None.
d) Condition of Concrete Barriers Around Riser	-	_	-		None.
26) GVR-17	$\dashv$				
a) Condition of Gas Vent Riser	•				None
b) Condition of End Section - 90 Degree Elbows	-			<u></u>	None.
c) Condition of Riser Protection (HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser					None.
John de Barrers Around Riser		$\dashv$	$\dashv$		vone.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
27) GVR-18					
a) Condition of Gas Vent Riser			-	0	None.
b) Condition of End Section - 90 Degree Elbows	-	0	·=	0	None.
c) Condition of Riser Protection (HDPE Pipe)				0	None.
d) Condition of Concrete Barriers Around Riser			•	0	None.
28) GVR-19					
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	•			0	None.
c) Condition of Riser Protection (HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser			-		None.
29) GVR-20					
a) Condition of Gas Vent Riser			-		None.
b) Condition of End Section - 90 Degree Elbows	•		•		None.
c) Condition of Riser Protection (HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	-				None.
30) GVR-21					
a) Condition of Gas Vent Riser	•		-		None.
b) Condition of End Section - 90 Degree Elbows	•				None.
c) Condition of Riser Protection (HDPE Pipe)	-		•		None.
d) Condition of Concrete Barriers Around Riser	•		-	_	None.
31) GVR-22					
a) Condition of Gas Vent Riser	<b>.</b>		-		None.
b) Condition of End Section - 90 Degree Elbows	-	_	-		None.
c) Condition of Riser Protection (HDPE Pipe)			-	_	None.
d) Condition of Concrete Barriers Around Riser	-		-		Barriers pushed into asphalt curb (minor damage).
		_	-		
32) GVR-23		_			
a) Condition of Gas Vent Riser		<u>-</u>	-		None.
b) Condition of End Section - 90 Degree Elbows	-	<u> </u>	┋┤	_	None.
c) Condition of Riser Protection (HDPE Pipe)	-	믜	-		None.
d) Condition of Concrete Barriers Around Riser	-		-	믜	None.
32) CVP 24				$\dashv$	
33) GVR-24			_	_	•
a) Condition of Gas Vent Riser		-	-		None.
b) Condition of End Section - 90 Degree Elbows	-	-	+		None.
c) Condition of Riser Protection (HDPE Pipe)		計	<del></del>	_	None.
d) Condition of Concrete Barriers Around Riser	-	-	=		None.
			L		

### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 7 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) GVR-25	_				
a) Condition of Gas Vent Riser	-	<u> </u>	-		None.
b) Condition of End Section - 90 Degree Elbows	-	<u>-</u>	-		None.
c) Condition of Riser Protection (HDPE Pipe)	-	0	-		None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
25.037	ļ	<u> </u>	<u> </u>	_	
35) GVR-26	_		_		
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-				None.
c) Condition of Riser Protection (HDPE Pipe)	-	-			None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
36) GVR-27			-		
- 5 	-		_	_	
a) Condition of Gas Vent Riser b) Condition of End Section - 90 Degree Elbows	_			_	None.
c) Condition of Riser Protection (HDPE Pipe)		_		_	None.
d) Condition of Concrete Barriers Around Riser					None.
dy Condition of Concrete Barriers Arouna Riser			_	_	None.
MONITORING WELLS					
37) 1MW2S					enemakan menambakan menambahan menambahan menan kantan pada sahi pada sahi sahi sahi sahi sahi sahi sahi sah
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover	-		-	0	None.
c) Condition of Well Lock			•	_	None.
38) 2LMW7S					
a) Condition of Surface Surrounding Well Cover	-		-	_	None.
b) Condition of Flush Mount Well Cover	-		•		None.
c) Condition of Well Lock	_		•	_	None.
	_			_	
9) 2LMW7D	_				
a) Condition of Surface Surrounding Well Cover		_	-	_	None.
b) Condition of Flush Mount Well Cover	-	믜		_	None.
c) Condition of Well Lock	-	_		<u>-  </u>	None.
	-	_	_	_	
0) 2LMW8S	ľ	_		_	
a) Condition of Surface Surrounding Well Cover	-	<u> </u>	_	<del>-  </del> '	None.
	-	0	-	<del>_  </del>	None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
41) 2LMW8D			T.		
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover	_		-	<u> </u>	None.
c) Condition of Well Lock	-		-		None.
	+	-	-	╀	
(42) 2LMW9D	_		<u> </u>		
a) Condition of Surface Surrounding Well Cover	-			무	None.
b) Condition of Flush Mount Well Cover	╁		-	<u> </u>	None.
c) Condition of Well Lock	╀╸	-	╀		None.
43) 2LMW13S	+-	-	+	-	
a) Condition of Surface Surrounding Well Cover	_		_		None.
b) Condition of Flush Mount Well Cover	-	┢	-		None.
c) Condition of Well Lock					None.
	T -				indire.
44) 2LMW13D					
a) Condition of Surface Surrounding Well Cover	-		-	0	None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock	-				None.
	_		<u> </u>		
45) 2LMW14D	_		_		
a) Condition of Surface Surrounding Well Cover		-	-	0	None.
b) Condition of Flush Mount Well Cover		-	-	<del>  -</del>	None.
c) Condition of Well Lock	┝	H	-		None.
46) 2LMW17S	<del> </del>	1		<u> </u>	
a) Condition of Surface Surrounding Well Cover	-	_		_	None.
b) Condition of Flush Mount Well Cover	-	_		1	None.
c) Condition of Well Lock	-				None.
47) 2LMW17D					
a) Condition of Surface Surrounding Well Cover	-				None.
b) Condition of Flush Mount Well Cover	•		-		None.
c) Condition of Well Lock	_		•		None.
48) 2LMW18S		.			
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock	_		-	믜	None.

## SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 9 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
49) 2LMW18D					
a) Condition of Surface Surrounding Well Cover	▝		_		None.
b) Condition of Flush Mount Well Cover	-	<u> </u>	-		None.
c) Condition of Well Lock	-		-	무	None.
50) 2LMW19S	╁	<del>                                     </del>	-		
a) Condition of Protective Casing					N
b) Condition of Well Cover		-		-	None.
c) Condition of Well Lock	•	-		_	None.
d) Condition of Well Protection - Bollards	-	_	-	_	None.
51) 2LMW19D					
a) Condition of Protective Casing			•	_	None.
b) Condition of Well Cover					None.
c) Condition of Well Lock	•		•		None.
d) Condition of Well Protection - Bollards	-				None.
52) 2LMW20S	İ				
a) Condition of Protective Casing	-			_	None.
b) Condition of Well Cover	-	0	•	_	None.
c) Condition of Well Lock	-		•		None.
d) Condition of Well Protection - Bollards			-		None.
53) 2LMW20D				$\dashv$	
a) Condition of Protective Casing	_				
b) Condition of Well Cover		-		$\exists$	None.
c) Condition of Well Lock	-		_	긁	None.
d) Condition of Well Protection - Bollards				_	None.
the second of th				_	None.
54) 3MW12D (Abandoned/Replaced)					
a) Condition of Protective Casing		_	-	0	None.
b) Condition of Well Cover	•		-	-	None.
c) Condition of Well Lock	-			$\equiv$	None.
d) Condition of Well Protection - Bollards	-		-	$\overline{a}$	None.
55) 2WMW21S			T		
a) Condition of Protective Casing			•		None.
b) Condition of Well Cover	•		-		None.
c) Condition of Well Lock	-	0			None.
d) Condition of Well Protection - Bollards	_		•		None.

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	Т	Ţ	E2	(m)	
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE	REPAIRS/MAINTENANCE	NOTES AND COMMENTS
56) 2WMW21D	T	亡	= 2	12.	
a) Condition of Protective Casing	•		-	0	None.
b) Condition of Well Cover	•		-		None.
c) Condition of Well Lock	-		-	0	None.
d) Condition of Well Protection - Bollards			-		None.
57) 2WMW3S					
a) Condition of Protective Casing	-		-		None.
b) Condition of Well Cover	-		-	<u>-</u>	None.
c) Condition of Well Lock			-		None.
d) Condition of Well Protection - Bollards	-		_		None.
	↓	ļ		<u> </u>	
[58] 2WMW3D	_	l_	l _	_	•
a) Condition of Protective Casing			-	<u> </u>	None.
b) Condition of Well Cover	<u> </u>		_		None.
c) Condition of Well Lock	<u> </u>		-		None.
d) Condition of Well Protection - Bollards			-	<u> </u>	None.
50) 21 01/10	_			-	
59) 2LOWIS				_	
a) Condition of Surface Surrounding Well Cover	_	-	_	0 0	None.
b) Condition of Flush Mount Well Cover			-	1 0	None.
c) Condition of Well Lock	⊢		-		None.
60) 2LOW1D					
a) Condition of Surface Surrounding Well Cover			-	_	None
b) Condition of Flush Mount Well Cover	•		•		None.
c) Condition of Well Lock					None.
					TOTIC.
61) 2LOW2S					
a) Condition of Surface Surrounding Well Cover			•		None.
b) Condition of Flush Mount Well Cover	•		-		None.
c) Condition of Well Lock	•		-		None.
62) 2LOW3S					
a) Condition of Surface Surrounding Well Cover			-	_	None.
b) Condition of Flush Mount Well Cover	-		•		None.
c) Condition of Well Lock	•	_	•	0	None.
M4				$\perp$	
63) 2LOW4S					
a) Condition of Surface Surrounding Well Cover		$\rightarrow$	•		None.
b) Condition of Flush Mount Well Cover	-		-	믜	None.
c) Condition of Well Lock	-		-		None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
64) 2LPW1S					
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover	-			0	None.
c) Condition of Well Lock			-		None.
	-	_	_	<u> </u>	
65) 2LMW28DS	_	_			
a) Condition of Surface Surrounding Well Cover	-		-	므	None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock				0	None.
66) 2LMW28F		_	_	_	
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover			_		None.
c) Condition of Well Lock			-		None.
	-				
67) 2LMW29A	_		_	_	
a) Condition of Surface Surrounding Well Cover	-		-		None,
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock			-		None.
68) 2LMW29F			_		
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	_	-		_	None.
c) Condition of Well Lock	$\vdash$	-	-	_	None.
69) 2LMW30DS			-	-	
a) Condition of Surface Surrounding Well Cover				_	
b) Condition of Flush Mount Well Cover		$\overline{}$		$\overline{}$	None.
c) Condition of Well Lock		$\overline{}$	-	_	None.
,			_		Norie.
70) 2LMW30F		_	$\neg +$	.	
a) Condition of Surface Surrounding Well Cover	-		•	ا را	None
b) Condition of Flush Mount Well Cover	•	-		_	None.
c) Condition of Well Lock					
		$\dashv$	$\neg +$		None.
71) 2LMW31DS		$\dashv$	$\neg$	_	
a) Condition of Surface Surrounding Well Cover	_		-	_ ,	None.
b) Condition of Flush Mount Well Cover	-	-	-	<del>;  </del>	None.
c) Condition of Well Lock		_	-		None.
	$\dashv$	$\dashv$	$\top$		100

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
72) 2LMW32DS					
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock	-	<u> </u>			None.
72) 21 M3V22F	+-		┝	-	
73) 2LMW32F			_		
a) Condition of Surface Surrounding Well Cover b) Condition of Flush Mount Well Cover	-			<del> </del>	None.
c) Condition of Well Lock		-	-	-	None.
oy common by wen book	+	+	<u> </u>	<del>                                     </del>	None.
74) 2LMW32B					
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock					None.
	_				
75) 2MW33DS					
a) Condition of Surface Surrounding Well Cover	▮■		-		None.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock	╀-				None.
76) 2LMW33F					
a) Condition of Surface Surrounding Well Cover					Mana
b) Condition of Flush Mount Well Cover				_	None.
c) Condition of Well Lock	-				None.
	<b>†</b>				None.
77) 2LMW34DS					
a) Condition of Surface Surrounding Well Cover	-				None.
b) Condition of Flush Mount Well Cover	•		•		None.
c) Condition of Well Lock	•		•		None.
78) 2WMW38DS	_	_	_		
a) Condition of Protective Casing		-	-	$\overline{}$	None.
b) Condition of Well Cover			-		None.
c) Condition of Well Lock			-		None.
d) Condition of Well Protection - Bollards	-		-	-	None.
79) 2WMW39DS		-	-	-	
a) Condition of Protective Casing	•	_	-	_ ,	None.
b) Condition of Well Cover	•	古	-	<del>  </del>	None.
c) Condition of Well Lock		一		<del></del>	None.
d) Condition of Well Protection - Bollards		一			
		_ ,		- 11	None.

### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 13 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
COLANA TIVICANA	INSP	DOE	REPA	REPA	
80) 2WMW40DS					
a) Condition of Protective Casing		-		-	None.
b) Condition of Well Cover c) Condition of Well Lock	<u>-</u>		-	<del>                                      </del>	None.
d) Condition of Well Protection - Bollards	<del>                                     </del>	-		-	None.
ay Common of well Protection - Bollarus	<del> </del>		$\vdash$		None.
81) 2WMW41DS			<del>                                     </del>		
a) Condition of Protective Casing	-	.0	-	_	None.
b) Condition of Well Cover				0	None.
c) Condition of Well Lock	-		-	_	None.
d) Condition of Well Protection - Bollards			-		None.
82) 2WMW42DS					
a) Condition of Protective Casing			=		None.
b) Condition of Well Cover			•		None.
c) Condition of Well Lock			•		None.
d) Condition of Well Protection - Bollards	-		=		None.
83) 2WMW43DS	_	_			
a) Condition of Protective Casing	•		-		None.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock d) Condition of Well Protection - Bollards		-	-		None.
a) Condition of well Protection - Bollaras		_	_	_	None.
84) 2WMW44DS					
a) Condition of Protective Casing	_	_	_	_	None.
b) Condition of Well Cover	•				None.
c) Condition of Well Lock			•		None.
d) Condition of Well Protection - Bollards	•				None.
85) 2WMW45DS					
a) Condition of Protective Casing	•	_	-	Π.	None.
b) Condition of Well Cover	•		•		None.
c) Condition of Well Lock	-		=	0	None.
d) Condition of Well Protection - Bollards	-		-	_ !	None.
86) 2WMW46DS					
a) Condition of Protective Casing	_		-		None.
b) Condition of Well Cover	-	0			None.
c) Condition of Well Lock	-		-		None.
d) Condition of Well Protection - Bollards			-	_	None.

### SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 14 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
87) 2WMW47DS					
a) Condition of Protective Casing	-		-		None.
b) Condition of Well Cover	•		-		None.
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards			-		None.
88) 3MW37S					
a) Condition of Protective Casing	-	0	-	•	None.
b) Condition of Well Cover			•		None.
c) Condition of Well Lock		0	-	_	None.
d) Condition of Well Protection - Bollards	•		-	_	None.
89) 4MW1S					
a) Condition of Protective Casing	-	0			None.
b) Condition of Well Cover	•	_	-	_	None.
c) Condition of Well Lock	•		■		None.
d) Condition of Well Protection - Bollards	-		-		None.

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Adequacy of O&M at Site: (Discuss issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.)
In general, the landfill cap system is in fair condition and is functioning as designed to meet the long-term remedial requirements. There are a few maintenance items that should be addressed this construction season. The maintenance items and other noted deficiencies should be corrected as noted on Table 1-1, Deficiency Log.
Notes: (Discuss and clarify any comments or observations related to this inspection.)
None.
(Discuss all items that were deficient during the inspection. Also provide recommendations for the deficient items - such as continued monitoring and inspection or repair and further remedial action.)  See attached Deficiency Log (Table 1-1) for noted deficiencies and recommended corrective actions.
Timothy D. Nichols, P.E.  Printed Name of Inspector  Signature of Inspector / Date
Certification Statement:  I hereby certify that a complete and through inspection and evaluation of the site and implemented remedy has been performed, and that the items noted on this inspection form have been assessed with respect to the intent of the implemented remedy and the remedial action objectives established for the site.
Printed Name of O&M Engineer Printed Name of NSB-NLON IRP Manager
Signature of O&M Engineer / Date Signature of NSB-NLON IRP Manager / Date
 g

## SITE 2 - AREA A LANDFILL INSPECTION CHECKLIST Page 16 of 16

Provide additional notes or sketch of site as needed:	
See attached site map (Figure 1-1).	
See attached site map (rigute 1-1).	
	· ·

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 16 of 16

Provide additional notes or sketch as needed:	
See attached Site Plan	
	*
	:
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	·
	· ·

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 1 of 16

nspection Date: December 29, 2004	v., 11A	nitoring			
aprenda survi survinor sur sur sur	Scott Hard	ing, P.E. / 1	Nobis		
NSPECTOR/COMPANY	Te	mperature:	45	5-F	
WEATHER CONDITIONS:		Weather: Other:	Ove	reast	
YPE OF INSPECTION:			r Weather I	Event Inspec cient Items	
· ·			NOT		
•			ANCE	ANCE	
AREA OF INSPECTION		PPLY	INTER	JNTEN	NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	
NSTITUTIONAL CONTROLS					
) Security Fencing					
a) Fencing Around Developed Parking Area					Access to Deployed Parking Area was not available at time of inspection
b) Entrance gate to Deployed Parking Area					None.
c) Fence Foundations in Deployed Parking Area					Access to Deployed Parking Area was not available at time of inspection
d) Entrance Gate at Thresher Road					None.
e) Entrance Gate at Wahoo Avenue					None.
f) No Trespassing and Security Signs					Signs were present.
g) Indications of Vandalism or Tresspassing					None.
AP ABEAS					
) Plateau Asphalt Cap Area	o anomara, ana				
a) General Condition of Asphalt Pavement				-	General condition ok with exception of joint separation.
b) Level or Designed Slope Within Pavement	-				None.
c) Cracks in Pavement				\ <b>  </b>	Some cracks/joint separation. Some of the existing sealant has shrunk.
d) Erosion on Pavement or Adjacent Areas					None.
e) Holes/Penetrations in Ashpalt Surface				D .	None.
f) Bulges in Asphalt Surface	-				None.
g) Standing Water - other than above (b)					None
h) Stability of Slopes amd Adjacent Areas			-		None.
i) Groundwater Monitoring Penetrations	-				None.
j) Damage to Pavement Caused by Area A Use					Lack of surface protection for staged trailers, equipment, and materials.
K) Exposed Cap Components			<u> </u>		None. ttire sections of asphalt pavement could not be observed.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 2 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
3) Sideslope Riprap Cap Area					·
a) General Condition of Northern Catch Basin	•				None. Trash and vegetation has been removed.
b) General Condition of Gabion Protection			_		None.
c) Localized Depressions in Riprap	-		-		None.
d) Erosion in Riprap or Adjacent Areas	-				None.
c) Standing Water - other than above (c)	-		-		None.
f) Stability of Slopes and Adjacent Areas	=				None.
g) Groundwater Monitoring Well Penetrations	**		-		None.
h) Exposed Cap Components	-				None.
i) Presence of Leachate Seeps at Toe of Slope				-	Minor leachate breakouts observed at north toe/wetland.
4) Crane Test Pad	_	_	_	_	,
a) General Condition of Concrete Pad					Cracks on pavement observed around corners and sides of pad.
b) Standing Water - other than above (a)					None.
	<i>607071000</i>				
5) Drainage Channel A	<u>.</u>				
a) General Condition of Drainage Swale					Minor amount of loose vegetion observed in swale and around culverts.
b) Condition of Asphalt Channel Lining					Unable to inspect due to snow cover.
c) Siltation within Swale					Unable to inspect due to snow cover.
d) Invasive Vegetation within Swale			]	-	Some loose vegetation in one portion of swale.
e) Localized Depressions or Heaving	-			<del></del>	None.
f) Condition of Culvert 1 Headwall			-		None.
g) Condition of Culvert 1 (Elliptical Pipe)					Some loose vegetation around pipes.
h) Condition of Culvert 1 Endwall	_	-			None.
i) Condition of Culvert 2 Headwall					None.
j) Condition of Culvert 2 (Elliptical Pipe)	-	<del>                                     </del>			Some loose vegetation around pipes.
k) Condition of Culvert 2 Endwall	_				None.
6) Drainage Channel B					
					Channel B was not inspected due to lack of access to the deployed parking area.
a) General Condition of Drainage Swale					
b) Condition of Asphalt Channel Lining	]				
c) Siltation within Swale					
d) Invasive Vegetation within Swale					
e) Localized Depressions or Heaving					
f) Condition of ADS Culvert (Parking Entrance)					

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 3 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
7) Drainage Channel C					
a) General Condition of Drainage Swale			=		None
b) Condition of Asphalt Channel Lining					Unable to inspect due to snow cover.
c) Siltation within Swale					Unable to inspect due to snow cover.
d) Invasive Vegetation within Swale					None.
e) Localized Depressions or Heaving					None.
f) Condition of culvert Under Parking Entrance			-	_	None.
			ļ		
8) Drainage Channel D		l	_	_	Channel D was not inspected due to lack of access to the deployed parking area.
a) General Condition of Drainage Swale	+ =				
b) Condition of Asphalt Channel Lining	╀╬				
c) Siltation within Swale	<del>│ □</del>				
d) Invasive Vegetation within Swale	╀┖		<u> </u>		
e) Localized Depressions or Heaving	╀-				
9) Drainage Channel E	-	<u> </u>			
a) General Condition of Drainage Swale		l			None.
b) Condition of Asphalt Channel Lining	1 =	-	<del>  -</del>		Unable to inspect due to snow cover.
c) Siltation within Swale	┼-				Unable to inspect due to snow cover.
d) Invasive Vegetation within Swale	T				None.
		Ì			
GAS VENTS					
Only Cursory check of Gas Vents was perform	med. A c	omprehen	sive chec	k will be	made during the future inspections.
10) GVR-1				-	
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
		<u> </u>			
11) GVR-2					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
12) GVR-3					
a) Condition of Gas Vent Riser					
b) Condition of Gas Vent Riser  b) Condition of End Section - 90 Degree Elbows	<del>  -</del>		-		
c) Condition of Riser Protection ( HDPE Pipe)	1 =		0		
d) Condition of Concrete Barriers Around Riser			<u> </u>		
	1	1	T	T	

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 4 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
13) GVR-4					
a) Condition of Gas Vent Riser			0		
b) Condition of End Section - 90 Degree Elbows			0		
c) Condition of Riser Protection ( HDPE Pipe)	0			П	
d) Condition of Concrete Barriers Around Riser	0.		0		
14) GVR-5		_		l	
a) Condition of Gas Vent Riser	<u> </u>				
b) Condition of End Section - 90 Degree Elbows				<del></del>	
e) Condition of Riser Protection ( HDPE Pipe)		-			AN
d) Condition of Concrete Barriers Around Riser					
15) GVR-6		ļ. —			
a) Condition of Gas Vent Riser	-	┝╬╴		-	
b) Condition of End Section - 90 Degree Elbows		-	<del>                                     </del>		
c) Condition of Riser Protection ( HDPE Pipe)		-	-		
d) Condition of Concrete Barriers Around Riser	┢╼	┝▔	<del>                                     </del>	┢ <u>┈</u>	
16) GVR-7	<u> </u>		<del>                                     </del>		
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows	<del>-</del>		<u>-</u>		
c) Condition of Riser Protection ( HDPE Pipe)	-		-		
d) Condition of Concrete Barriers Around Riser					
17) GVR-8					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows	0				
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser	0		0		
18) GVR-9					
a) Condition of Gas Vent Riser	<u> </u>				· · · · · · · · · · · · · · · · · · ·
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)	<u> </u>				
d) Condition of Concrete Barriers Around Riser			-		
		<u> </u>			
19) GVR-10		l		_	
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows	□				
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 5 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
20) GVR-11	_				
a) Condition of Gas Vent Riser	0				
b) Condition of End Section - 90 Degree Eibows	0				
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
att CVIII 12	<u> </u>				
21) GVR-12					
a) Condition of Gas Vent Riser	<del>                                     </del>		-		
b) Condition of End Section - 90 Degree Elbows	-				
c) Condition of Riser Protection ( HDPE Pipe)				-	
d) Condition of Concrete Barriers Around Riser	-		-		
22) GVR-13					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows	0		0		
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
dy condition of control survivis rabbat rabba					
23) GVR-14					
a) Condition of Gas Vent Riser			0		
b) Condition of End Section - 90 Degree Elbows			0		
c) Condition of Riser Protection ( HDPE Pipe)			٥		
d) Condition of Concrete Barriers Around Riser					
24) GVR-15					
a) Condition of Gas Vent Riser	<u> </u>				
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
25) GVR-16					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
26) GVR-17					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 6 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
27) GVR-18					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)	. 🗆				
d) Condition of Concrete Barriers Around Riser					
28) GVR-19					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser	<u> </u>	<u> </u>		-	
29) GVR-20	· ·				
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser				0	
30) GVR-21					
a) Condition of Gas Vent Riser		□.		. 🗆	
b) Condition of End Section - 90 Degree Elbows					
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
31) GVR-22					Inspected during December site visit.
a) Condition of Gas Vent Riser					None.
b) Condition of End Section - 90 Degree Elbows					None.
c) Condition of Riser Protection ( HDPE Pipe)					None
d) Condition of Concrete Barriers Around Riser				. 🗆	Barriers push into asphalt curb (minor damage).
32) GVR-23		· .		<del> </del>	
i '					
a) Condition of Gas Vent Riser					
b) Condition of End Section - 90 Degree Elbows	-			<del>                                     </del>	
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser	<del>                                     </del>				
33) GVR-24					
a) Condition of Gas Vent Riser					Not inspected. Di d not have access to Deployed Parking Area.
b) Condition of End Section - 90 Degree Elbows					Not inspected. Di d not have access to Deployed Parking Area.
c) Condition of Riser Protection ( HDPE Pipe)					Not inspected. Did not have access to Deployed Parking Area.
d) Condition of Concrete Barriers Around Riser			0		Not inspected. Di d not have access to Deployed Parking Area.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 7 of 16

					and the second s
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) GVR-25	<u> </u>				
a) Condition of Gas Vent Riser					Not inspected. Di d not have access to Deployed Parking Area.
b) Condition of End Section - 90 Degree Elbows					Not inspected. Di d not have access to Deployed Parking Area.
c) Condition of Riser Protection ( HDPE Pipe)					Not inspected. Di d not have access to Deployed Parking Area.
d) Condition of Concrete Barriers Around Riser					Not inspected. Di d not have access to Deployed Parking Area.
35) GVR-26					
a) Condition of Gas Vent Riser					Not inspected. Di d not have access to Deployed Parking Area.
b) Condition of End Section - 90 Degree Elbows					Not inspected. Di d not have access to Deployed Parking Area.
c) Condition of Riser Protection ( HDPE Pipe)					Not inspected. Di d not have access to Deployed Parking Area.
d) Condition of Concrete Barriers Around Riser					Not inspected. Di d not have access to Deptoyed Parking Area.
36) GVR-27		1	1		
a) Condition of Gas Vent Riser	□				Not inspected. Di d not have access to Deployed Parking Area.
b) Condition of End Section - 90 Degree Elbows					Not inspected. Di d not have access to Deployed Parking Area.
c) Condition of Riser Protection ( HDPE Pipe)					Not inspected. Di d not have access to Deployed Parking Area.
d) Condition of Concrete Barriers Around Riser					Not inspected. Di d not have access to Deployed Parking Area.
niconnantatino menerara mentera di materia d	natumasin o sicus	amiotasternimi	aurunaveava	emieroromanana	entoriarimususianimanimanimanimanimanimanimanisti.
MONITORING WELLS					
					comprehensive check will be made during the next inspections.
A portion of the wells were inspected during t	the Octob	er 2004 sa	ampling r	ound and	are noted accordingly.
37) 1MW2S	1 _	_	l _	l _	
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
	1				T
38) 2LMW7S	_			_	
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock		<u> </u>			
39) 2LMW7D	I	Ī	<u> </u>		I .
a) Condition of Surface Surrounding Well Cover     b) Condition of Flush Mount Well Cover					
		-	<del></del> -		
c) Condition of Well Lock		I	L	<u> </u>	
40) 2LMW8S			T	T	T
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
by condition of a non-recommendation of the Corte	<del>                                     </del>	П	<del></del>		

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 8 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
41) 2LMW8D					
a) Condition of Surface Surrounding Well Cover			<u> </u>		
b) Condition of Flush Mount Well Cover	0				
c) Condition of Well Lock					
		·	,		
42) 2LMW9D					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	0				
c) Condition of Well Lock					
43) 2LMW13S		_	_	_	
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
		T			
44) 2LMW13D				_	
a) Condition of Surface Surrounding Well Cover	0				
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
40.00 0000		Ι'			
45) 2LMW14D			_		
a) Condition of Surface Surrounding Well Cover			<u> </u>		
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
46) 2LMW14D		<u> </u>		ı	
	_				
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock		<u> </u>			
47) 2LMW17D					
a) Condition of Surface Surrounding Well Cover	-				
b) Condition of Flush Mount Well Cover	-				
c) Condition of Well Lock		<del>_</del>			
48) 21.MW18S		Γ			
·	0				
a) Condition of Surface Surrounding Well Cover			-		, , , , , , , , , , , , , , , , , , , ,
b) Condition of Flush Mount Well Cover c) Condition of Well Lock					

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 9 of 16

AREA OF INSPECTION		PLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	NTENANCE ED	NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRS/MAI RECOMMENE	REPAIRS/MAINTENANCE RECOMMENDED	
49) 2LMW18D					
a) Condition of Surface Surrounding Well Cover			0		
b) Condition of Flush Mount Well Cover			_		
c) Condition of Well Lock					
50) 2LMW19S	1	T :		1	
a) Condition of Surface Surrounding Well Cover	-				
b) Condition of Flush Mount Well Cover c) Condition of Well Lock	_				
d) Condition of Well Protection - Bollards					
t) Common of Well Protection - Bonards				<u> </u>	
51) 2LMW19D					
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock			0		None.
d) Condition of Well Protection - Bollards					None.
	1				
52) 2LMW20S					Inspected during December 2004 site visit.
a) Condition of Surface Surrounding Well Cover	-				Significant damage around well cover.
b) Condition of Flush Mount Well Cover	-			•	No well cover present.
c) Condition of Well Lock				•	Well lock damaged and not working
					·
53) 2LMW20D	_	_		_	Inspected during December 2004 site visit.
a) Condition of Surface Surrounding Well Cover					Significant damage around well cover.
b) Condition of Flush Mount Well Cover				-	No well cover present.
c) Condition of Well Lock				<u> </u>	Well lock damaged and not working
54) 3MW12D (Abandoned/Replaced)				<u> </u>	
a) Condition of Surface Surrounding Well Cover		·			
b) Condition of Flush Mount Well Cover	0				
c) Condition of Well Lock					
d) Condition of Well Protection - Bollards					
55) 2WMW21S					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	-				None,
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards			-		None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 10 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
56) 2WMW21D					
Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock	-				
d) Condition of Well Protection - Bollards	<u> </u>			<u> </u>	
57) 2WMW3S	<u>.</u>		I	I	
	<del>-</del>				
a) Condition of Surface Surrounding Well Cover				ļ	
b) Condition of Flush Mount Well Cover			<u> </u>		
c) Condition of Well Lock			<u> </u>		
d) Condition of Well Protection - Bollards					
	!				
58) 2WMW3D				l	
a) Condition of Surface Surrounding Well Cover			0		
b) Condition of Flush Mount Well Cover			0		
c) Condition of Well Lock					
d) Condition of Well Protection - Bollards					
	ī .	-			
59) 2LOW1S					
Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover			-		
c) Condition of Well Lock	<u> </u>	<b>!</b>	L	<b>L</b>	
60) 2LOW1D	i i	1	1	<u> </u>	
		l			
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	0			-	
c) Condition of Well Lock		L. <u></u>			
	<u> </u>	<del> </del>			
61) 2LOW2S	l _	l _	l _		
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover			0		
c) Condition of Well Lock					
	1 -				
62) 2LOW3S			,		
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	0.				
c) Condition of Well Lock		Π.			
	<u> </u>	•	·	·	
63) 2LOW4S	T T	<u> </u>		<u> </u>	
a) Condition of Surface Surrounding Well Cover	-	-	-		
b) Condition of Flush Mount Well Cover	-			$\vdash$	
a CINDROUGH OF WEB LOCK		. –			

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 11 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
64) 2LPW1S					
Constitution of Confere Comment line Well Comme					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
65) 2LMW28DS					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
	l.		<del>-</del>		
66) 2LMW28F					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover			0		·
c) Condition of Well Lock					
67) 2LMW29A	-			l	
a) Condition of Surface Surrounding Well Cover	_				·
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock	0		0		
	1				
68) 2LMW29F					
a) Condition of Surface Surrounding Well Cover	0				
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock			0		
	1				
69) 2LMW38DS					
a) Condition of Surface Surrounding Well Cover	l 👝 '				
b) Condition of Flush Mount Well Cover	-		_		
c) Condition of Well Lock					
	l .		1	<u> </u>	
70) 2LMW30F	<u> </u>	<u> </u>	<u> </u>		
a) Condition of Surface Surrounding Well Cover	-		-		
b) Condition of Flush Mount Well Cover	-		-		
c) Condition of Well Lock	·			<u> </u>	
	<u> </u>	1	•	1	
71) 2LMW31DS	l _	l _	l		
a) Condition of Surface Surrounding Well Cover	-				
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 12 of 16

					The state of the s
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
72) 2I.MW32DS					
a) Condition of Surface Surrounding Well Cover	0				
b) Condition of Flush Mount Well Cover	0		0		
c) Condition of Well Lock					
		T			
73) 2LMW32F				_	
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	-		<u> </u>		
c) Condition of Well Lock	<u> </u>				
	<u> </u>	ı	Γ .	1	
74) 2LMW32B					
a) Condition of Surface Surrounding Well Cover			0		
b) Condition of Flush Mount Well Cover	-		<del>                                     </del>		
c) Condition of Well Lock	<u> </u>			L	
75) 2LMW39DS	<u> </u>	1	<u> </u>	T	
a) Condition of Surface Surrounding Well Cover	<del>                                     </del>		-	<del>-</del>	
b) Condition of Flush Mount Well Cover	╁		-	<del>                                     </del>	
c) Condition of Well Lock	<u> </u>	L			
76) 2LMW39F	i				1
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
	1		,		
77) 2LMW34DS					
a) Condition of Surface Surrounding Well Cover			0		
b) Condition of Flush Mount Well Cover					
e) Condition of Well Lock	0				
	i	•			
78) 2WMW38DS					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover		. 🗆			None.
c) Condition of Well Lock	•				None.
d) Condition of Well Protection - Bollards					None.
	1				
79) 2WMW39DS					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	=				None.
c) Condition of Well Lock	_				None.
d) Condition of Well Protection - Bollards					None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 13 of 16

AREA OF INSPECTION		PLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	NTENANCE ED	NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRS/MAII RECOMMEND	REPAIRS/MAINTENANCE RECOMMENDED	
80) 2WMW40DS					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover			=		None.
b) Condition of Flush Mount Well Cover			•		None.
c) Condition of Well Lock	-				None.
d) Condition of Well Protection - Bollards				. 🗆	None.
	<u> </u>				
81) 2WMW41DS	٠				Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					Standing water observed around well pad.
b) Condition of Flush Mount Well Cover	<b>=</b> .		_		None.
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards					None.
		_			
82) 2WMW42DS		l _		_	Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover					Some gravel missing from around well and presence of standing water.
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards					None.
	1	T			
83) 2WMW43DS	_	۱ _		۱ _	Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover	-		_		None.
b) Condition of Flush Mount Well Cover	-			<b></b>	Standing water observed around pad.
c) Condition of Well Lock		┝╬╌	_		None.
d) Condition of Well Protection - Bollards		<u> </u>		<u> </u>	None.
84) 2WMW44DS	<del></del>	T		ľ	
					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover		┝╬╴	<del>-</del>		None.
b) Condition of Flush Mount Well Cover	╁┋╴	$\vdash \exists$			Gravel eroded away and sanding water present.
c) Condition of Well Lock					None.
d) Condition of Well Protection - Bollards			_		None.
85) 2WMW45DS		· ·	<u> </u>	T	<u> </u>
	l .	-			Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	<del> </del>				None.
c) Condition of Well Lock	<b>├</b>		-		None.
d) Condition of Well Protection - Bollards	<u> </u>				None.
86) 2WMW46DS	İ		<u> </u>	Γ	Land Company C
					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover	+=				None.
b) Condition of Flush Mount Well Cover	+=	<u> </u>	<del>                                     </del>		Gravel eroded away and sanding water present.
c) Condition of Well Lock	+=				None.
d) Condition of Well Protection - Bollards			_		None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 14 of 16

AREA OF INSPECTION	TED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
	INSPECTED	a Sjoo	REPAIR	REPAIR	
87) 2WMW47DS					Inspected during October 2004 Sampling Round.
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	-				Gravel eroded away and sanding water present.
c) Condition of Well Lock	-				None.
d) Condition of Well Protection - Bollards	-				None.
	1				
88) 3MW37S				<u> </u>	Inspected during December 2004 site visit.
a) Condition of Surface Surrounding Well Cover				-	Some gravel missing from gravel box. Soil beneath box has washed away.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock					None.
-,			<del></del>	·	
89) 4MW1S	T		Ĭ	l	Inspected during December 2004 site visit.
a) Condition of Surface Surrounding Well Cover					Slight Lean to Standpipe. Well still accessible.
b) Condition of Standpipe					None.
c) Condition of Well Lock	<del>                                     </del>				None.
d) Condition of Well Protection - Bollards	_		_		None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 15 of 16

Adequacy of O&M at Site: Discuss issues and observatious relater protectiveness of the remedy.)	ed to the implementation and scape of ()&\$1 pro	codures. En particular, discuss their relationsl	rip to the current and teng-term	
resources at the tellent.)	fair condition and is functioning as designed to meet		•	
hould be addressed this construction of	mion.	тые нацияна темены теринетских, т вете аге	a sea, inminicipance wears their	
			•	
Notes:				
	r observations related to this inspection.)			
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rone.				
	The state of the s			
			4	
•		**************************************		
				<del></del>
	Jarding, P.E.	_ Scott Ho	11M2 8/2	5/05
Printed Nam	e of Inspector	Sign	esture of terspectal Date	
Certification Statements			<u></u>	
I hereby certify that a complete and	thorough inspection and evaluation of the site as	nd implemented remedy has been performed.	and that the items noted on this	
inspection for at have been assessed v	rith respect to the latest of the implemented resident	ody and the remedial action objectives establis	med for the site.	
	•			
			•	
		- Richard D.	$C_{\bullet} + T_{\bullet}$	
Printed Name o	FORM Engineer	nie nard 1).	me of NSB-NLON IRP Monager	····
^ -	Digitally signed by Robert J.	Friench cell	HE AL MANAGEMENT OF THE PROPERTY.	
Khidh Jen	Tess Date: 2005.09.12 08:55:22 - 04'00'	man	Dungto	
Signature of O&	M Engineer / Date	7 Signature of	NSB-NLON IRF Manager / Date	_
· · · · · · · · · · · · · · · · · · ·				

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 16 of 16

Provide additional notes or sketch as needed:	
See attached Site Plan	
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#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 1 of 16

SITE NAME: Site 2 - Area A Landfill (OU1) EPA ID: CTD980906515 SITE LOCATION: New London County, CT EPA REGION: Region 1 REMEDY AT SITE: Landfill Cover, Institutional	Control, N	<b>loni</b> toring			
Date: October 12, 2005 INSPECTOR/COMPANY	Courtney	D. Moore, J	r., P.E./ Nobis	s Engineerin	ıg, Inc.
WEATHER CONDITIONS:	•	Temperature Weather Other	: Overcast, w	5'F windy, rainy	- - -
TYPE OF INSPECTION:		Annual Ins Post-Major Re-Inspect Other	spection r Weather Eve tion of Deficie	ent Inspectio	
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIBUMAINTENANCE NOT RECOMMENDED	REPAIRSMA INTENANCE RECOMMENDED	NOTES AND COMMENTS
INSTITUTIONAL CONTROLS					
1) Security Fencing					
a) Fencing Around Deployed Parking Area					None
b) Entrance gate to Deployed Parking Area			-		None.
c) Fence Foundations in Deployed Parking Area			-		None.
d) Entrance Gate at Thresher Road			-		None.
e) Entrance Gate at Wahoo Avenue					None.
f) No Trespassing and Security Signs			<b>.</b>		None.
g) Indications of Vandalism or Trespassing				0	None.
CAP AREAS		I.S.			
2) Plateau Asphalt Cap Area				,	
a) General Condition of Asphalt Pavement	· 🖷		-	0	None
b) Level or Designed Slope Within Pavement	-		-		
c) Cracks in Pavement					None.
d) Erosion on Pavement or Adjacent Areas				-	Cracks on slope behind barriers and in deployed parking area. Vegetation growing in the cracks.
e) Holes/Penetrations in Asphalt Surface					None.
f) Bulges in Asphalt Surface					None.
g) Standing Water - other than above (b)	-				Some bulges noted in deployed area.  None.
h) Stability of Slopes and Adjacent Areas					None.
i) Groundwater Monitoring Penetrations		0	•		None.
j) Damage to Pavement Caused by Use	-		-		None.
K) Exposed Cap Components				-	Obvious signs of damage to asphalt surface.
					OVI TOLE STEEL V. Gallinge V. Supran. Survey
<u> </u>		<u> </u>			

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 2 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPARS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
3) Side Slope Riprap Cap Area					
a) General Condition of Northern Catch Basin	-		-		None
b) General Condition of Gabion Protection			-		Good.
c) Localized Depressions in Riprap					None.
d) Erosion in Riprap or Adjacem Areas	-		•		None.
e) Standing Water - other than above (c)					None.
f) Stability of Slopes and Adjacent Areas	-				None.
g) Groundwater Monitoring Well Penetrations					None.
h) Exposed Cap Components	-				None.
i) Presence of Leachate Seeps at Toe of Slope	-		=		None.
4) Crane Test Pad		[ ]	[		
a) General Condition of Concrete Pad	_	<u> </u>			Significant crack around pad with vegetation growing in it.
b) Standing Water - other than above (a)	-		•		
STORM WATER FEATURES					
5) Drainage Channel A		l 1	1 1	Ī Į	
a) General Condition of Drainage Swale				-	Siltation noted.
b) Condition of Asphalt Channel Lining					None.
c) Siltation within Swale				-	Silitation noted, needs to be addressed.
d) Invasive Vegetation within Swale					Signs of invasive vegetation noted.
e) Localized Depressions or Heaving	-		-		None.
f) Condition of Culvert 1 Headwall	-				Noze.
g) Condition of Culvert 1 (Elliptical Pipe)	=				None.
h) Condition of Culvert 1 Endwall	_				Some vegetation and silt buildup around pipe.
i) Condition of Culvert 2 Headwall	-	<u> </u>	-		Sediment build up needs regular maintenance.
j) Condition of Culvert 2 (Elliptical Pipe)					Some vegetation and silt buildup around pipe.
k) Condition of Culvert 2 Endwall					Sediment build up remains
		<b></b>			<u> </u>
6) Drainage Channel B					
a) General Condition of Drainage Swale	-		-		None.
b) Condition of Asphalt Channel Lining				<b>.</b>	Invasive vegetation noted.
c) Siltation within Swale	-				Siltation noted in swale.
d) Invasive Vegetation within Swale				-	Vegetation noted growing through pavement.
e) Localized Depressions or Heaving				]	None.
	_				
f) Condition of ADS Culvert (Parking Entrance)					Overgrown with vegetation but open to flow.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 3 of 16

	T	<del></del>	<del></del>		
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPARS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
7) Drainage Channel C					
a) General Condition of Drainage Swale				-	Siltation needs to be removed.
b) Condition of Asphalt Channel Lining		- 🗆			None.
c) Siltation within Swale				•	Siltation in swale is causing ponding, needs to be removed.
d) Invasive Vegetation within Swale					Recently cut back.
e) Localized Depressions or Heaving			•		None.
f) Condition of culvert Under Parking Entrance					None.
8) Drainage Channel D	<b> </b>	<del>                                     </del>	<b></b>	<u> </u>	
	_ !	_ '	1 '_ '	_ '	
a) General Condition of Drainage Swale					Over grown with vegetation
b) Condition of Asphalt Channel Lining					None.
c) Siltation within Swale	-				None.
d) Invasive Vegetation within Swale					Invasive vegetation noted.
e) Localized Depressions or Heaving					None.
9) Drainage Channel E	<del>                                     </del>	<del></del>		$\vdash$	
a) General Condition of Drainage Swale					
b) Condition of Asphalt Channel Lining					None.
c) Siltation within Swale			-		None.
d) Invasive Vegetation within Swale					Reddish color to drainage flow. Some.
					Some.
GASVENTS			1		action of the second of the se
10) GVR-1					
a) Condition of Gas Vent Riser	=		-	0	None.
b) Condition of End Section - 90 Degree Elbows	•				No screen.
c) Condition of Riser Protection ( HDPE Pipe)			-		None.
d) Condition of Concrete Barriers Around Riser	•		-		None.
11) GVR-2		.		$\bar{l} = l$	
a) Condition of Gas Vent Riser	-		-	<u> </u>	None
b) Condition of End Section - 90 Degree Elbows	-				No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	-			<u> </u>	None.
12) GVR-3					
a) Condition of Gas Vent Riser  h) Condition of End Section - 90 Degree Fibours					None.
b) Condition of End Section - 90 Degree Elbows c) Condition of Riser Protection ( HDPE Pipe)	-				No screen.
d) Condition of Riser Protection (HDPE Pipe)  d) Condition of Concrete Barriers Around Riser					None.
d) Condition of Concrete Barners Around Niser	-				None.
L	1		i	. 1	

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 4 of 16

	7				
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
13) GVR-4					
a) Condition of Gas Vent Riser			-		Noae.
b) Condition of End Section - 90 Degree Elbows	-	D		-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)		0			None.
d) Condition of Concrete Barriers Around Riser	•		-		None.
14) GVR-5			<u> </u>	_	
a) Condition of Gas Vent Riser					None.
b) Condition of End Section - 90 Degree Elbows				-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
15) GVR-6					
	_		_		
a) Condition of Gas Vent Riser					None.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser					
16) GVR-7					
a) Condition of Gas Vent Riser	-		_		
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)			-		No screen.
d) Condition of Concrete Barriers Around Riser					
17) GVR-8					
a) Condition of Gas Vent Riser			•		
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)					
d) Condition of Concrete Barriers Around Riser	-				Appears to have been moved based on mark in asphalt.
18) GVR-9		l	1		
a) Condition of Gas Vent Riser			_		
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)	-				
d) Condition of Concrete Barriers Around Riser			<u> </u>		Vegetation growing around and under barriers.
19) GVR-10	_	_ [	_		
a) Condition of Gas Vent Riser					even.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)			-		
d) Condition of Concrete Barriers Around Riser	-			-	Needs one more barrier.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 5 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
20) GVR-11					
a) Condition of Gas Vent Riser	-		-	0	None.
b) Condition of End Section - 90 Degree Elbows	•		0	-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)			-		None.
d) Condition of Concrete Barriers Around Riser	-				Only two sides protected, should protect parking side.
21) GVR-12					
a) Condition of Gas Vent Riser					None.
b) Condition of End Section - 90 Degree Elbows  c) Condition of Riser Protection ( HDPE Pipe)				-	No screen.
d) Condition of Concrete Barriers Around Riser					None.
o, condition of condition bankers (noting region					None.
22) GVR-13		-			
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-				No screen.
c) Condition of Riser Protection ( HDPE Pipe)		. 🗆	-		None.
d) Condition of Concrete Barriers Around Riser					Crack in payement within 3 barriers with vegetation growth.
23) GVR-14					
a) Condition of Gas Vent Riser				- 0	None.
b) Condition of End Section - 90 Degree Elbows	<b>-</b>			-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)			-		None.
d) Condition of Concrete Barriers Around Riser				_	Many cracks in asphalt with vegetation growing through.
24) GVR-15					
	_	_			
a) Condition of Gas Vent Riser		$\exists$			None.
b) Condition of End Section - 90 Degree Elbows				-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)  d) Condition of Concrete Barriers Around Riser		-			None.
ay Condition of Concrete Barriers Around Riser					None.
25) GVR-16					
a) Condition of Gas Vent Riser	-			_	None.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)	-		-	J	None.
d) Condition of Concrete Barriers Around Riser	-		•		Guano on plastic barrel.
26) GVR-17	İ		T		
a) Condition of Gas Vent Riser			-		None.
b) Condition of End Section - 90 Degree Elbows	-	<u> </u>			No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser					None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 6 of 16

<u></u>	<del></del>				
AREA OF INSPECTION	INSPECTED	DOPS NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
27) GVR-18					
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows	-				No screen.
c) Condition of Riser Protection ( HDPE Pipe)	-		•		None.
d) Condition of Concrete Barriers Around Riser	-		-		None.
28) GVR-19					
a) Condition of Gas Vent Riser			•		None.
b) Condition of End Section - 90 Degree Elbows	-				No screen.
c) Condition of Riser Protection ( HDPE Pipe)			•		None.
d) Condition of Concrete Barriers Around Riser	-	0	-		None.
29) GVR-20					·
a) Condition of Gas Vent Riser	-		-		None.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser		0	=		None.
30) GVR-21					
a) Condition of Gas Vent Riser			-		None.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser					Noue.
31) GVR-22					
a) Condition of Gas Vent Riser			-		None.
b) Condition of End Section - 90 Degree Elbows	. =				No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	•	0		-	Vegetation growing, asphalt burm is broken.
32) GVR-23					
a) Condition of Gas Vent Riser	_		-		None.
b) Condition of End Section - 90 Degree Elbows					No screen.
c) Condition of Riser Protection ( HDPE Pipe)			•		None.
d) Condition of Concrete Barriers Around Riser	-		•		None.
33) GVR-24					
a) Condition of Gas Vent Riser	_				Noise.
b) Condition of End Section - 90 Degree Elbows	-		0		No screen.
c) Condition of Riser Protection ( HDPE Pipe)		-			None.
d) Condition of Concrete Barriers Around Riser	-	0			None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 7 of 16

		1	T	T	
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) GVR-25					
a) Condition of Gas Vent Riser	•		-		None.
b) Condition of End Section - 90 Degree Elbows				-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser	•			0	None.
35) GVR-26				<del>                                     </del>	
a) Condition of Gas Vent Riser	=		-		None.
b) Condition of End Section - 90 Degree Elbows	•				No screen.
c) Condition of Riser Protection ( HDPE Pipe)	-		-		None.
d) Condition of Concrete Barriers Around Riser			-		None.
36) GVR-27					
a) Condition of Gas Vent Riser	-				Tree growing adjacent to vent.
b) Condition of End Section - 90 Degree Elbows				-	No screen.
c) Condition of Riser Protection ( HDPE Pipe)					None.
d) Condition of Concrete Barriers Around Riser			-		None.
MONITORING WELLS					
37) IMW2S					
a) Condition of Surface Surrounding Well Cover					Not inspected, possibly buried under barrier.
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
		-		-	
38) 2LMW7S	_	_	_	_	
a) Condition of Surface Surrounding Well Cover				-	Vegetative growth and seed on portion of well cover.
b) Condition of Flush Mount Well Cover					Missing bolt.
c) Condition of Well Lock					None.
39) 2LMW7D			·		
a) Condition of Surface Surrounding Well Cover	-		$\dashv$	<b>=</b>	None.
b) Condition of Flush Mount Well Cover					Steel cover lose and pulled up.
c) Condition of Well Lock				اــــــا	None.
49) 2LMW8S		1			
a) Condition of Surface Surrounding Well Cover	_				
b) Condition of Flush Mount Well Cover		-	-	· _	Area around well is damaged.
c) Condition of Well Lock					Well is damaged, needs to be abandoned.  None.
<del></del>					Note:

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 8 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE, NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
41) 2LMW8D					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					Not inspected due to obstructions covering the well.
c) Condition of Well Lock					
		<b></b>	<b>L</b>	l	
42) 2LMW9D		<u> </u>			Τ
a) Condition of Surface Surrounding Well Cover			_		
b) Condition of Flush Mount Well Cover	-			-	None. Loose bolt.
c) Condition of Well Lock	-				Loose boit. None.
			<u> </u>	<u> </u>	None.
43) 2LMW13S					
a) Condition of Surface Surrounding Well Cover	-	Π.			
b) Condition of Flush Mount Well Cover					Some sediment building up on top.
c) Condition of Well Lock					Some sediment building up on top.
c) Condition of Well Edek		- <del></del>			None.
44) 2LMW13D					
a) Condition of Surface Surrounding Well Cover			0		
b) Condition of Flush Mount Well Cover				_	Vegetative growth at interface with pavement.
c) Condition of Well Lock					Missing bolt, coming up ajar.
Continue of wen book					None.
45) 2LMW14D					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	-	_			None.
c) Condition of Well Lock			_		None.
e) Condition of Well Lock				L.J	None.
46) 2LMW7S		÷1			
a) Condition of Surface Surrounding Well Cover	_				·
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock			-		None.
c) Condition of Well Loca					None.
47) 2LMW17D					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	-	-			Concrete is broken.
c) Condition of Well Lock			-		None.
c) Condition of Well Lock					None.
48) 2LMW18S		T			
		_		_ [	
a) Condition of Surface Surrounding Well Cover				_	Covered with sediment, concrete is cracked.
b) Condition of Flush Mount Well Cover c) Condition of Well Lock	-				Covered with sediment.
C/ Condition of Well Lock					None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
49) 2LMW18D					
a) Condition of Surface Surrounding Well Cover					W
b) Condition of Flush Mount Well Cover					Water puddle on concrete.
c) Condition of Well Lock				<u> </u>	Steel plate missing, cover loose, exposed to weather.  None.
		<b>L</b> .,	.L	L	None.
50) 2LMW19S	ľ		<b></b>	]	T
a) Condition of Protective Casing			-		Paint speckled with rust.
b) Condition of Well Cover					Cover jammed on with rope underneath.
c) Condition of Well Lock	•				None noted, rope trailing out of casing.
d) Condition of Well Protection - Bollards					None.
	. <u> </u>		<u> </u>		Protec.
51) 2LMW19D					
a) Condition of Surface Surrounding Well Cover	-				Rust patches noted.
b) Condition of Flush Mount Well Cover			-		None.
c) Condition of Well Lock				0	Lock is rusty.
d) Condition of Well Protection - Bollards	•	-			None.
	1		<u> </u>	<u> </u>	Product.
52) 2LMW20S					
a) Condition of Surface Surrounding Well Cover					Replaced in depression.
b) Condition of Flush Mount Well Cover	-			0	Panially under water.
c) Condition of Well Lock		-			None.
53) 2LMW20D					
a) Condition of Surface Surrounding Well Cover				-	Area around well is damaged.
b) Condition of Flush Mount Well Cover				•	No cover present, well is exposed to weather.
c) Condition of Well Lock					None.
54) 3MW12D (Abandoned/Replaced)					
a) Condition of Protective Casing					Well is abandoned.
b) Condition of Well Cover					
c) Condition of Well Lock					
d) Condition of Well Protection - Bollards					
5) 2WMW21S					
a) Condition of Protective Casing					None.
b) Condition of Well Cover					None.
c) Condition of Well Lock	-		-		None.
d) Condition of Well Protection - Bollards	-				None.

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	T	1			
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	RECOMMENDED  RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
56) 2WMW21D			1		
a) Condition of Protective Casing			-		None.
b) Condition of Well Cover	-				Well cover is loose.
c) Condition of Well Lock					Well lock is broken.
d) Condition of Well Protection - Bollards		-			None.
	1				
57) 2WMW3S					
a) Condition of Protective Casing					Not inspected, unable to locate, possibly buried under growth.
b) Condition of Well Cover		D			
c) Condition of Well Lock					
d) Condition of Well Protection - Bollards					
58) 2WM W3D				<u> </u>	
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock					None.
l l		· · · · · ·			
59) 2LOW1S					
a) Condition of Surface Surrounding Well Cover	-		-		Partially buried under wooden pallet.
b) Condition of Flush Mount Well Cover			_=_	. 🗆	Partially buried under wooden pallet.
c) Condition of Well Lock					None.
60) 21.OWID					
	_		_	_	
a) Condition of Surface Surrounding Well Cover	-				Under water some siltation noted unable to fully inspect.
b) Condition of Flush Mount Well Cover					
c) Condition of Well Lock					
61) 2LOW2S					
		_			
a) Condition of Surface Surrounding Well Cover	-				Under wooden pallets, unable to fully inspect.
b) Condition of Flush Mount Well Cover c) Condition of Well Lock		-		-	
C) Condition of West Lock			1		We was a second of the second
62) 2LOW3S		—т	1		
a) Condition of Surface Surrounding Well Cover	-		_		N
b) Condition of Flush Mount Well Cover			-		None.
c) Condition of Well Lock		-			Well cover is uneven and onside is partially up. None.
					TOIL.
(3) 2LOW4S	T			-	
a) Condition of Surface Surrounding Well Cover		_			Under wooden pallets with sandbags, unable to inspect.
b) Condition of Flush Mount Well Cover	一				один почем рамов тип ваничада, шаст, и науки.
c) Condition of Well Lock	_			0	

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 11 of 16

	<u> </u>				
AREA OF INSPECTION	INSPECTED	DOFS NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
64) 21.PW1S					
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover					In area of wood storage.  None.
c) Condition of Well Lock	-				None.
65) 2LMW28DS	-			I	
a) Condition of Surface Surrounding Well Cover					Well not found, many items stored in this area.
b) Condition of Flush Mount Well Cover					wen not toung, many nems stored in this area.
c) Condition of Well Lock				. 0	
		· · ·			
66) 2LMW28F					
a) Condition of Surface Surrounding Well Cover	-	0			Well is under water and sediment, vegetative growth covering area around and on well cover.
b) Condition of Flush Mount Well Cover	-				wen is under water and seament, vegetanve grown covering area stround and on wen cover.
c) Condition of Well Lock	<b>III</b>			0	None.
					pone.
67) 2LMW29A					
a) Condition of Surface Surrounding Well Cover	=				Small puddle noted on the concrete.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock		-			None.
68) 2LMW29F					
a) Condition of Surface Surrounding Well Cover			-		None.
b) Condition of Flush Mount Well Cover			-		None.
c) Condition of Well Lock					Nове.
69) 2LMW30DS					
a) Condition of Surface Surrounding Well Cover	-				Located behind garbage dumpster.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock		-			None.
	· ·				
70) 2LMW30F		- 1		l	
a) Condition of Surface Surrounding Well Cover	-			=	Well is partially covered by garbage dumpster.
b) Condition of Flush Mount Well Cover			· 🚃		None.
c) Condition of Well Lock					None.
1					
71) 2LMW31DS	1		l		
a) Condition of Surface Surrounding Well Cover					Nobe.
b) Condition of Flush Mount Well Cover	-		-		None.
c) Condition of Well Lock		-			None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 12 of 16

	_				
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
72) 2LMW32DS	<del> </del>		+	<del>                                     </del>	
a) Condition of Surface Surrounding Well Cover				-	Vegetative growth around concrete edge.
b) Condition of Flush Mount Well Cover		п			Vegetative growth around concrete edge.  None.
c) Condition of Well Lock	•			-	Nose.
	ŀ			<u> </u>	prome.
73) 21.MW32F					
a) Condition of Surface Surrounding Well Cover	•			-	Vegetative growth around well cover.
b) Condition of Flush Mount Well Cover	•		-		None.
c) Condition of Well Lock					None.
74) 2LMW32B	[	[ '	[ '		
a) Condition of Surface Surrounding Well Cover	-				Vegetative growth around well cover.
b) Condition of Flush Mount Well Cover	=				None.
c) Condition of Well Lock					None.
	1				
76) 21.MW39F	1 1	1		1	
a) Condition of Surface Surrounding Well Cover					Not inspected.
b) Condition of Flush Mount Well Cover				0	
c) Condition of Well Lock					
77 71 MW2/DC					
77) 2LMW34DS	1 _ 1	1 _ 1	l = l	1 _ 1	
a) Condition of Surface Surrounding Well Cover	-				None.
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock				D	None.
78) 2WMW38DS			<del></del>		
	_	1 _	L = -1	1 _ 1	
a) Condition of Protective Casing					Rusty.
b) Condition of Well Cover					Nose.
c) Condition of Well Destroite Dellects	3		-		Lock is in good condition.
d) Condition of Well Protection - Bollards					None.
79) 2WMW39DS			$\overline{}$	r <del></del>	
1		_	/ <b>_  </b>		
a) Condition of Protective Casing					Rusty.
b) Condition of Well Cover c) Condition of Well Lock					None.
					Lock is in good condition.
d) Condition of Well Protection - Bollards				, U p	None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 13 of 16

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT . RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
80) 2WMW40DS					
a) Condition of Protective Casing		0			Rusty.
b) Condition of Well Cover	1 111				None.
c) Condition of Well Lock			-		Lock in good condition.
d) Condition of Well Protection - Bollards					None.
	!	· · · · · ·			
81) 2WMW41DS	_	_	[ _		
a) Condition of Protective Casing	-		-		Rusty.
b) Condition of Well Cover	-				None.
c) Condition of Well Lock					Lock in good condition.
d) Condition of Well Protection - Bollards					None.
82) 2WMW42DS			<u> </u>	F	T
	_		I _ I		
a) Condition of Protective Casing				<u>-</u>	Rusty.
b) Condition of Well Cover					None.
c) Condition of Well Lock					Lock in good condition.
d) Condition of Well Protection - Bollards					None.
83) 2WMW43DS					I and the second
a) Condition of Protective Casing					
b) Condition of Well Cover					Minor rust noted.  None.
c) Condition of Well Lock			_		Lock in good condition.
d) Condition of Well Protection - Bollards					None.
					Prote.
84) 2WMW44DS					
a) Condition of Protective Casing	-		-	0	Rusty
b) Condition of Well Cover	-		-	]	None.
c) Condition of Well Lock					Lock in good condition.
d) Condition of Well Protection - Bollards			Ö		None.
85) 2WMW45DS	_				·
a) Condition of Protective Casing	-				Rusty.
b) Condition of Well Cover	-		-		None.
c) Condition of Well Lock					Lock in good condition.
d) Condition of Well Protection - Bollards	-				None.
<u> </u>					
86) 2WMW46DS	1	1		. ]	
a) Condition of Protective Casing	-		-		Rusty.
b) Condition of Well Cover	-		•		None.
c) Condition of Well Lock	-		-		Lock in good condition.
d) Condition of Well Protection - Bollards		-			None.

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
87) 2WMW47DS					
a) Condition of Protective Casing					Rusty.
b) Condition of Well Cover					None.
c) Condition of Well Lock			-		Lock in good condition.
d) Condition of Well Protection - Bollards					None.
88) 3MW37S					
a) Condition of Protective Casing	-				Rusty.
b) Condition of Well Cover			=		None.
c) Condition of Well Lock					Lock in good condition.
d) Condition of Well Protection - Bollards					None.
89) 4MW1S				-	
a) Condition of Protective Casing	1 1		-		Paint is chipping.
b) Condition of Well Cover	-			]	None.
c) Condition of Well Lock					Lock is in good condition.
d) Condition of Well Protection - Bollards		-			None.

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 15 of 16

Adequacy of O&M at Site: Overall, O&M practices of the site are suffic	tient. Current practices should be su	fficient to maintain	s the effectiveness	of the remedy.				
							•	
					2 .			
Nates:		**************************************		<b>*****</b>				
As described in checklist above								
•								
Courtney D. M			and the second	Just	Moon	12/	5/05	
Printed Name	of Inspersor	. *			Signaling of to	spector / Date	7	
Certification Statement: I hereby certify that a complete and thr	ough inspection and evaluation of (	the site and imple	mented remedy i	nas been perform	ed, and that the items :	ated on this	, , , , , , , , , , , , , , , , , , ,	
inspection form have been assessed with	respect to the intent of the implem	nenisá remedy sa	d the remedial a	ellan objectives e	stablished for the site.			
Robert J. To			Ric	chord	D. Cono	nt Jr		
Printed Name of t	J&M Engineer		***************************************		Printed Name of NSB	NLON IRP Manager		
14 1 11 21	Digitally signed by Robert J. Tess, PE Oate: 2005.11.10 15:56:43 -05	5'00'	ma	190	Cun	2 Z	Dec OS	
Signature of O&M	Engineer / Date			Sig	nature of NSB-NLO	N IRP Manager / Da	-	

#### INSPECTION CHECKLIST SITE 2 - Area A Landfill Page 16 of 16

Provide additional notes or sketch as needed:	•
See attached Site Plan	

A.2 DRMO

#### INSPECTION CHECKLIST SITE 6 - DRMO SITE NAME: Site 6 - DRMO (OU2) EPA ID: CTD980906515 SITE LOCATION: New London County, CT EPA REGION: Region I REMEDY AT SITE: Landfill Cover, Institutional Controls, Monitoring 11-Jul-2003 Tim Nichols, P.E. / ECC INSPECTOR/COMPANY WEATHER CONDITIONS: Temperature: 70IH Weather: Rain NA Other: Annual Inspection TYPE OF INSPECTION: D Post-Major Weather Event Inspection ☐ Re-Inspection of Deficient Items Other\_ KEPAIRSMAINTENANCE VOT RECOMMENDED REPAIRSMAINTENANCE DOES NOT APPLY NOTES AND COMMENTS AREA OF INSPECTION NSPECTED INSTRUCTION OF CONTROLS 1) Security Fencing invasive vegetation growing through fence a) East Perimeter Fence along Rail Road Tracks -O 0 Invasive vegetation growing through fence. b) South Perimeter Fence along Storm Discharge -None. c) Locked Entrance or Secure Access 0 . None d) No Trespossing and Security Signs . D -Ω None e) Indications of Vandalism or Trespassing APAREAS 2) Asphalt Cap Area \* Pavement in good condition. a) General Condition of Asphalt Pavement O See item 2g. b) Level or Designed Slope Within Pavement D -None. c) Cracks in Pavement = Ω None. d) Erosion in Pavement or Adjacent Areas Sinkhole immediately south of cap area and depressions further south 0 g) Holes/Penetrations in Asphalt Surface f) Bulges in Asphalt Surface 0 Standing water along west perimeter due to sedimentation of jersey barriers. g) Standing Water - other than above (b) . . k) Stability of Slopes and Adjacent Areas O \* = O Unable to inspect some wells located beneath standing water. i) Groundwater Monitoring Well Penetrations o j) Dumage to Pavement Caused by DRMO Use None. . U \* None k) Exposed Cap Components STORM WATER FEATURES 3) Drainage Swale O Low flow in swale. a) General Condition of Western Drainage Swale D --Good condition. b) Condition of 2-inch Gravel Lining O -c) Amount of Siltation within Swale

## SITE 6 - DRMO INSPECTION CHECKLIST Page 2 of 6

4) Concrete Catch Basin  9. General Condition of Visite Assembly  5. Couldring of Statistics within Carch Basin  9. General Condition of Statistics within Carch Basin  9. General Condition of Statistics within Carch Basin  9. General Condition of Statistics within Carch Basin  9. General Condition of Discharge Pipe  9. General Condition of Discharge Pipe  9. General Condition of Discharge Pipe  9. General Condition of Discharge Pipe  9. General Condition of Discharge Pipe  9. General Condition of Discharge Pipe  9. General Condition of Piper Discharge Pipe  9. General Condition of Biggrap Protection  9. General Condition of Biggrap Protection  9. General Condition of Biggrap Protection  9. Condition of Piper Course County Rises  9. Condition of Piper Course Pai  9. Condition of Well Concrete Pai  9. General Condition of Well Concrete Pai  9. General Condition of Piper Course Pai  9. Condition of Well Concrete Pai	AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
5) Condition of Grate Assembly  c) Associated Stitution within Carch Bards  a) General Condition of Discharge Pipe  c) Associated Stitution within Pipe  c) Associated Stitution within Pipe  c) Associated Stitution of Discharge Pipe  c) Associated Stitution of Discharge Pipe  c) Associated Stitution of Discharge Pipe  c) Associated Stitution of Discharge Pipe  c) Associated Stitution of Religional Condition of Discharge Pipe  c) Associated Stitution of Condition of Rights Pipe Condition  6) Thomas River Rights  a) General Condition of Rights Protection  6) Thomas River Rights  a) General Condition of Rights Protection  6) Thomas River Rights  a) General Condition of Rights Protection  6) To be re-inspected during annual sampling event in August 2003.  7) Association of Well Concrete Pail  7) Condition of Well Concrete Pail  8) Condition of Well Concrete Pail  8) Condition of Well Concrete Pail  8) Condition of Well Concrete Pail  8) Condition of Well Concrete Pail  9) Condition of Well Co	4) Concrete Catch Basin				-	
6) Condition of Grote Assembly  7) Anouni of Situition within Carch Bath  8	a) General Condition of Northern Catch Basin	-		<b></b>		横端 경기 가는 아이는 집에서 가는 사람들이 하는 것이 되었다. 그는 그들은 그는 그는 그를 하는 것이 없는 그를 다고 있다.
5) Culvert Outfall p) General Condition of Discharge Pips l) Amount of Situation within Pipe l) Amount of Situation within Pipe l) Amount of Situation within Pipe l) Amount of Situation within Pipe l) Condition of Cudet Place and Riprup Outfall l) III III III III III III III III III I			-	-		
a) General Condition of Discharge Pipe  b) Amount of Situation within Pipe c) Condition of Guidet Plare and Ripray Outfoil  6) Thanes River Ripray a) General Condition of Ripray Protection  8) Page page in good condition.  6) Thanes River Ripray a) General Condition of Ripray Protection  8) Page page in good condition.  7) 6MWIS a) Condition of Protective Casing/Riser b) Condition of Well Cover c) Condition of Well Cover d	c) Amount of Siltation within Catch Basin		-	<del>  -</del>	-	None.
b) Amount of Situation within Pipe c) Condition of Outlet Flare and Riprup Outfall c) Condition of Outlet Flare and Riprup Outfall c) Condition of Riprup Protection	하는 사람들은 사람들이 되는 사람들이 가장하는 사람들이 되었다. 그런 사람들이 되었다면 하는데 살아 없는데 그렇게 되었다.	D			0	
c) Condition of Vett Cover c) Condition of Protective Casing/Riser a) Condition of Protective Casing/Riser b) Condition of Well Concrete Pad  s) Condition of Well Cover c) Condition of Well Cover c) Condition of Well Cover c) Condition of Well Cover c) Condition of Well Cover d) Condition of Well Cover c) Condition of Well Cover d) Condition of Well Cover c) Condition of Well Cover d) Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submer	상사 보다는 경우 아이들이 아름다면 가장 하면 하는 것은 사람들은 아이들은 사람들이 되었다.	o	-	-		Unable to inspect due to tidal conditions (pipe submerged).
A) General Condition of Rigrap Protection  NONITORING WELLS  7) 6MWIS  a) Condition of Protective Caring/Riser  b) Condition of Well Concrete Pad  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  To be re-inspected during annual sampling event in August 2003.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.	The state of the s	-	O	-	0	Riprap in good condition.
7) 6MWIS a) Condition of Protective Casing/Riser b) Condition of Well Cover c) Condition of Well Cover c) Condition of Well Cover c) Condition of Well Cover d) Condition of Well Cover c) Condition of Well Cover d) Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual	그 마음을 내려왔다. 그러움 얼마나면 하는 것은 말이 되었다. 그는 그는 그는 그를 살아왔다. 그는 그림을 걸		0	•	0	Riprap in good condition.
a) Condition of Protective Casing/Riser	MONITORING WELLS					
c) Condition of Well Lock  d) Condition of Well Concrete Pad  s		•		-	+	
a) Condition of Well Concrete Pad	b) Condition of Well Cover	-		-	-	
8) 6MW2S a) Condition of Protective Casing/Riser b) Condition of Well Cover c) Condition of Well Lock d) Condition of Well Concrete Pad  Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. None:	c) Condition of Well Lock	-	-	-	-	
a) Condition of Protective Casing/Riser		-	10	-	<u>                                   </u>	To be re-inspected during annual sampling event in August 2003.
b) Condition of Well Cover  c) Condition of Well Lock  d) Condition of Well Concrete Pad  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.	보는 하는 사람들에서 가면 역사 그렇게 되었는데, 이 그런 물수들은 하하다는 학생이라고 얼굴하게 하는데	п		р	В	Well submerged in standing water, to be inspected during annual sampling event.
Condition of Well Lock  d) Condition of Well Concrete Ped  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.			-	D		Well submerged in standing water, to be inspected during annual sampling event.
9) 6MW2D a) Condition of Protective Casing/Riser b) Condition of Well Cover c) Condition of Well Lock d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Well Cover d) Condition of Surface Surrounding Location d) Condition of Surface Surrounding Location d) Condition of Surface Surrounding Location  10) 6MW3D (Abandened near 6MW11D)	Account Comment	O	=	0		Well submerged in standing water, to be inspected during annual sampling event.
a) Condition of Protective Casing/Riser  b) Condition of Well Cover c) Condition of Well Lock d) Condition of Well Concrete Pad  well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.		0	-		0	Well submerged in standing water, to be inspected during annual sampling event.
b) Condition of Well Cover c) Condition of Well Lock d) Condition of Well Concrete Pad  Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event. Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.	[4급] [4] [1] [1] [4] [4] [4] [4] [4] [4] [4] [4] [4] [4	G	-	0		Well submerged in standing water, to be inspected during annual sampling event.
e) Condition of Well Lock d) Condition of Well Concrete Pad  well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.	- Anna Anna Anna Anna Anna Anna Anna Ann	Б	-		O	Well submerged in standing water, to be inspected during annual sampling event.
d) Condition of Well Concrete Pad  Well submerged in standing water, to be inspected during annual sampling event.  Well submerged in standing water, to be inspected during annual sampling event.  None.		a	-	O		Well submerged in standing water, to be inspected during annual sampling event.
a) Condition of Surface Surrounding Location None.		0	-		0	Well submerged in standing water, to be inspected during annual sampling event.
1 보통하는 사람들은 경찰 사람들은 사람들은 사람들은 사람들이 사용하는 사람들이 사용하는 사람들이 되었다. 그는 사람들은 사람들은 사람들은 사람들은 사람들은 사람들이 되었다. 그는 사람들은 사용하는	물로 이 그렇게 하는 것 같아. 그는 그 이는 그렇게 하지 않는 이번 생각을 받았다. 그는 그를 들어가 하는 그리고	•	-			None.
a) Condition of Surface Surrounding Location None.			1_	1		
	a) Condition of Surface Surrounding Location	-   -	-	1 1	1	None.

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AREA OF INSPECTION	INSPECTED	BOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE. RECOMMENDED	NOTES AND COMMENTS
12) 6MW4					
a) Condition of Protective Casing/Riser		0	-	0	To be re-inspected during annual sampling event in August 2003.
b) Condition of Well Cover	-	u	-	0	To be re-inspected during annual sampling event in August 2003.
c) Condition of Well Lock		a	-	O	To be re-inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Ped	-   -	0	**	D	To be re-inspected during annual sampling event in August 2003.
13) 6MW58  a) Condition of Protective Casing/Riser	o l	a	Б	0	To be inspected during annual sampling event in August 2003.
b) Condition of Well Cover		a	n	o	To be inspected during annual sampling event in August 2003.
c) Condition of Well Lock		O	П	o	To be inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Pad		0	0	0	To be inspected during annual sampling event in August 2003.
14) 6MWSD  a) Condition of Protective Casing/Riser	E	D	o	D	To be inspected during annual sampling event in August 2003.
b) Condition of Well Cover	0	D	O	D	To be inspected during annual sampling event in August 2003.
c) Condition of Well Lock	O	О	D	D	To be inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Pad		O	0	0	To be inspected during annual sampling event in August 2003.
15) 6MW6S  a) Condition of Protective Casteg/Riser	D	o	D	0	To be inspected during annual sampling event in August 2003.
b) Condition of Well Cover	0	O	D	0	To be inspected during annual sampling event in August 2003.
c) Condition of Well Lock	D	0	D	D	To be inspected during annual sampling event in August 2003.
d) Condition of Well Concress Pad	-   0	0	0		To be inspected during annual sampling event in August 2003.
16) 6MW6D  a) Condition of Protective Casing/Riser	<u> </u>	o	В	0	To be inspected during annual sampling event in August 2003.
b) Condition of Well Cover	0	0	0	D	To be inspected during annual sampling event in August 2003.
c) Condition of Well Lock	□	0	0	D	To be inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Pad	0	0	0	0	To be inspected during annual sampling event in August 2003.
17) 6MW7S  a) Condition of Protective Casung/Riser	0	0	D	0	To be inspected during annual sampling event in August 2003.
b) Condition of Well Cover	D	D	п	O	To be inspected during annual sampling event in August 2003.
c) Condition of Well Lock	D	O	D	D	To be inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Pad	lo	O	D	O	To be inspected during annual sampling event in August 2003.

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AREA OF INSPECTION	INSPICITO	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
18) 6MW8S		口			Lin August 2003
a) Condition of Protective Casing/Riser	-	0	-	0	To be re-inspected during annual sampling event in August 2003.
b) Condition of Well Cover	-		-	6	To be re-inspected during annual sampling event in August 2003.
c) Condition of Well Lock	-	<u> </u>			To be re-inspected during annual sampling event in August 2003.
d) Condition of Well Concrete Pad	-	0	-	0	To be re-inspected during annual sampling event in August 2003.
19) 6MW9S  a) Condition of Surface Surrounding Well Cover		0		О	To be re-inspected during annual sampling event in August 2003.
b) Condition of Flush Mount Well Cover	-		-	D	To be re-inspected during annual sampling event in August 2003.
c) Condition of Well Lock	-		-	n	To be re-inspected during annual sampling event in August 2003.
20) 6MW10S  a) Condition of Surface Surrounding Well Cover	0	О	0	o	Well submerged in standing water, to be inspected during annual sampling event.
b) Condition of Flush Mount Well Cover				u	Weil submerged in standing water, to be inspected during annual sampling event.
cj Condition of Well Lock	G		D		Well submerged in standing water, to be inspected during annual sampling event.
21) 6MW10D  a) Condition of Surface Surrounding Well Cover	D	G	o	0	Well submarged in standing water, to be inspected during annual sampling event.
b) Condition of Flush Mount Well Cover	0			0	Well submerged in standing water, to be inspected during annual sampling event.
c) Condition of Well Lock	П	П	<u>                                     </u>	<u> </u>	Well submerged in standing water, to be inspected during annual sampling event.
(22) 6MW115 a) Condition of Surface Surrounding Well Cover	0	0	0	0	Weil submerged in standing water, to be inspected during annual sampling event.
bi Condition of Flush Mount Well Cover			<u></u>	0	Well submerged in standing water, to be inspected during annual sampling event.
c) Condition of Well Lock	U	0	0	0	Well submerged in standing water, to be inspected during annual sampling evant.
23) 6MW11D  a) Condition of Surface Surrounding Well Cover	a		ם	-	Well submerged in standing water, to be inspected during annual sampling event.
b) Condition of Flush Mount Well Cover	ם			0	Well submerged in standing water, to be inspected during annual sampling event.
c) Condition of Well Lock				0	Well submerged in standing water, to be inspected during annual sampling event.

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Adequacy of O&M at Site: (Discuss insues and observations related to the implementation and scope of O&M pro- remedy.)	cedures. In particular, discuss their relationship to the current and long-term protectiveness of the
In general, the landfill cap system is in good condition and is functioning as de should be corrected this construction season as noted on Table 1-1. Deficiency	esigned to meet the long-term remedial requirements. Some maintenace related deficiencies y Log.
Notes: (Discuss and charify any comments or observations related to this inspection.)	
None.	
Deficiencies/Items Requiring Corrections: (Discuss all items that were deficient during the Inspection. Also provide recommenda action.)	tions for the deficient items - such as continued monitoring and inspection or repair and further remedial
See attached Deficiency Log (Table 1-1) for recommended corrective actions	
Timothy D. Nichols, P.E.	Signature of Inspector / Date
Printed Name of Inspector	Signature of Inspector / Date
Certification Statement:  I hereby certify that a complete and through inspection and evaluation of the sile and assessed with respect to the intent of the implemented remedy and the remedial action	implemented remedy has been performed, and that the items noise on this inspection form have been a objectives established for the site.
Printed Name of O&M Engineer	Printed Name of NSB-NLON IRP Manager
Signature of O&M Engineer / Date	Signature of NSB-NLON IRP Manager / Date

Page 6 of 6

Provide additional notes or sketch of site as ureded:			
하는 통령 이 집에 들었다면 보는 이 사람들이 들었다. 이 경우 이름이 나는 사람들이 많아 들었다면 하는 것이 되었다면 하는 것이 되었다.			
See attached site map (Figure 1-1).			
			5. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
			등이 보고 하고 있을까 보고 ! 영화 하는데 기를 즐겁는다.

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 1 of 6

SITE NAME: Site 6 - DRMO (OU2)					
EPA ID: CTD980906515					
SITE LOCATION: New London County, CT EPA REGION: Region 1					
REMEDY AT SITE: Landfill Cover, Institutiona	l Control, N	Aonitoring			
Inspection Date: December 29, 2004					
INSPECTOR/COMPANY	Scott Har	ding, P.E. /	Nobis		en en en en en en en en en en en en en e
WEATHER CONDITIONS:		Temperature	. 4	5-F	
		Weather	: Ov	ercast	<b>-</b>
		Other	· <u></u>	NA	
TYPE OF INSPECTION:	•	Annual In			
			or Weather I		
		Other	tion of Defi	icient nems	
AREA OF INSPECTION	<del></del>	<del></del>		1	NOTES AND COMMENTS
	1	İ	NOT		
			REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	
		H.Y	E a	Ea	
	₽ .	DOES NOT APPLY	AAA E	/MAE	
	INSPECTED	S X	OMB	OMB S	
	ž	<sup>2</sup>		33	
BUSTIFUZIONAL CONTROLS				Villa de la companya della companya della companya della companya de la companya della companya	
l) Security Fencing				a sunonamaganan	a armaniminama aminiminamaniminaman karapasa karantatari patatari patatari patatari patatari patatari patatari Tangan mananiminamaniminamaniminaman karapasa karantatari patatari patatari patatari patatari patatari patatar
a) East Perimeter Fence along Rail Road Tracks			-		Fence in good condition. Vegetation adequately removed.
b) South Perimeter Fence along Storm Discharge					Fence in good condition. Vegetation adequately removed.
c) Locked Entrance or Secure Access	-				None.
d) No Trespassing and Security Signs					Signs present on fence at entrance to DRMO
e) Indications of Vandalism or Trespassing					None.
CAP AREAS			WAR THE REAL PROPERTY OF THE PA		
2) Asphalt Cap Area	a onavanenasor	a anasmirani	r anomanonavens	K VOLUTEHOLIONIA	
a) General Condition of Asphalt Pavement			-		Pavement in good condition.
h) Laudan Darian d Class Wilder D	-				Build up of sediment observed along northwestern portion of site. Sediment should be removed. Depressions were
b) Level or Designed Slope Within Pavement				-	observed around well 6MW11D.
c) Cracks in Pavement					One area noted with cracks in pavement/concrete (around well 6MW11D).
d) Erosion on Pavement or Adjacent Areas	+=-				None.
e) Holes/Penetrations in Ashpalt Surface	+	<del> </del>			Previous conditions not observed due to snow cover.
f) Bulges in Asphalt Surface		<del>                                     </del>			None.
g) Standing Water - other than above (b)	<b>-</b>				None.
h) Stability of Slopes amd Adjacent Areas	-		_		None.
t) Groundwater Monttoring Penetrations	+=-	┡		-	Depressions observed around 6MW11S and 6MW11D. Should be repaired.
j) Damage to Pavement Caused by DRMO Use	-		-		Small area of damaged pavement along western boundary of site. Should be repaired.
K) Exposed Cap Components					None.
CHECK VALUE IN THE STATE OF THE	8 <i>1984 1988</i>	i interment	WARRING THE	MARKANAMA	
i) Drainage Swale	a didikanika	a assantini ka			Gildenkokokokololikiki Asikokolokiskokololikikikikikiki kitalikiki kitalikiki (1905) T
a) General Conditions of Western Drainage Swale					Small brush pile observed in swale.
b) Condition of 2-inch Gravel Lining					The state of the s
c) Amount of Siltation within Swale					None.
, , , , , , , , , , , , , , , , , , , ,					inone.

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 2 of 6

AREA OF INSPECTION				T."	NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	
4) Concrete Catch Basin					
a) General Condition of Northern Catch Basin	-		-		Catch basin in good condition.
b) Condition of Grate Assembly	<b>—</b>				None.
c) Amount of Siltation within Catch Basin					None.
5) Culvert Outfall					
a) General Condition of Discharge Pipe					Discharge pipe in good condition.
b) Amount of Siltation within Pipe					
	_				None.
c) Condition of Outlet Flare and Riprap Outfall					Riprap in good condition.
6) Thames River Riprap					
a) General Condition of Riprap Protection	-		-		Riprap in good condition.
MONTEORING WELLS					
7) 6MW1S					
a) Condition of Protective Casing/Riser	-				None.
b) Condition of Well Cover					None.
c) Condition of Well Lock					None.
d) Condition of Well Concrete Pad					None.
dy common by the combined 1 was		**			
8) 6MW2S					
Condition of Bustocking ContractBings					N
a) Condition of Protective Casing/Riser					None.
b) Condition of Well Cover					None.
c) Condition of Well Lock					None.
d) Condition of Well Concrete Pad					None.
9) 6MW2D					
			-		Carina laure aliabilista wast. Can still be correled if needed
a) Condition of Protective Casing/Riser					Casing leans slightly to west. Can still be sampled if needed.
b) Condition of Well Cover					None.
c) Condition of Well Lock		]			None.
d) Condition of Well Concrete Pad					None.
10) CANUSS (Abandoned man CANUS)					
10) 6MW3S (Abandoned near 6MW11S)	<b>—</b>		_		
a) Condition of Surface Surrounding Location					None.
1) AND Abadand was Callery					
11) 6MW3D (Abandoned near 6MW11D)					
a) Condition of Surface Surrounding Location					None.

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 3 of 6

AREA OF INSPECTION	<u> </u>		T	r	NOTES AND COMMENTS
1			E		100000000000000000000000000000000000000
	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE, NOT RECOMMENDED	REPAHRSMAINTENANCE RECOMMENDED	
12) 6MW4					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad		0			Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
13) 6MW5S					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
14) 6MW5D					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
15) 6MW6S					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
16) 6MW6D					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock	0				Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad			0		Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
17) 6MW7S					
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 4 of 6

AREA OF INSPECTION			T		NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	
18) 6MW8S			1		
a) Condition of Protective Casing/Riser					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Well Cover	0				Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
d) Condition of Well Concrete Pad	0	0	0		Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
19) 6MW9S					
a) Condition of Surface Surrounding Well Cover					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
b) Condition of Flush Mount Well Cover		0			Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
c) Condition of Well Lock		0			Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
					Not inspected due to equipment and/or snow cover. To be inspected during annual sampling event
20) 6MW10S					
a) Condition of Surface Surrounding Well Cover			. 🗆		Crack in pavement and patch for old test boring to north of 6MW10S - Should be repaired
b) Condition of Flush Mount Well Cover			-		
c) Condition of Well Lock					
21) 6MW10D		0			
a) Condition of Surface Surrounding Well Cover				┝╬╌	None.
b) Condition of Flush Mount Well Cover					None,
c) Condition of Well Lock			-		None.
22) 6MW11S				_	
a) Condition of Surface Surrounding Well Cover					Sinkhole observed around well cover. Area not flush with ground surface
b) Condition of Flush Mouns Well Cover					Well covers requires repair.
c) Condition of Well Lock					
23) 6MW11D					
a) Condition of Surface Surrounding Well Cover					Sinkhole observed around well cover. Area not flush with ground surface
b) Condition of Flush Mount Well Cover					Well covers requires repair.
c) Condition of Well Lock			-		

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 5 of 6

Adequacy of OdeM at Site:  (Discuss issues and observations related to the implementation and scope of OdeM procedus protectiveness of the remedy.)	res. In particular, discuss their relationship to the current and long-term
In general, the landfill cap system is in good condition and at fuscisoning as designed to meet the Some maintenance related deficiences should be corrected as noted above.	e long-term ramedual requirements
Notes:	
(Discuss and startify any comments or observations related to this inspection.)	
None.	
i de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	
(Discuss nti items that were deficient during the impection. Also provide recommendation and further remedial action.)	o for the deficient items - such as continued monitoring and luspection or rapair
Scott W. Harding, P.F.	Sest Herely 8/30/05
Printed Name of Inspector  Certification Statement:  I hereby certify that a complete and through inspection and evaluation of the site and implemented remedy a Juspection form have been assessed with respect to the intent of the implemented remedy a	nd the remedial action objectives catabilished for the sho.
Printed Name of O&M Engineer	Printed Name of NSB-NLON IRP Manager
Digitally signed by Robert J. Tess Date: 2005.09.12 09:09:28 -04'00'	Richard. D. Conant Jr. Printed Name of NSB-NLON IRP Mensger  Mil D Zeer Jr. 9/15/05
Signature of O&M Engineer / Date	Signature of NSB-NLON IRP Manager / Date

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 6 of 6

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 1 of 6

SITE NAME: Site 6 - DRMO (OU2) EPA ID: CTD980906515 SITE LOCATION: New London County, CT EPA REGION: Region 1					
REMEDY AT SITE: Landfill Cover, Institutiona	l Control, M	lonitoring			
Date: October 11, 2005 INSPECTOR/COMPANY	Courtney	D. Moore, J	1., P.E. / Nol	bis Engineer	ing, Inc.
WEATHER CONDITIONS:	T	emperature:	. 60	) F	
		Weather	Ove	ercast NA	
				-	
TYPE OF INSPECTION:				vent Inspect	ion
		Other			_
AREA OF INSPECTION	1		l .		NOTES AND COMMENTS
	1		REPAIRSMAINTENANCE NOT RECOMMENDED	<b>F</b>	
	1		ENANC	REPAIRSMAINTENANCE RECOMMENDED	
		DOES NOT APPLY	(AINT	IAINT	
	INSPECTED	F NOT	MRSA	IRSA	l l
	INS	ag a	RE C	M M M	
INSTITUTIONAL CONTROLS					200 100 100 100 100 100 100 100 100 100
1) Security Fencing					
a) East Perimeter Fence along Rail Road Tracks			-		None.
b) South Perimeter Fence along Storm Discharge	-				Noue.
c) Locked Entrance or Secure Access			-		None.
d) No Trespassing and Security Signs			-		Signs only read "Warning Authorized Personnel Only".
e) Indications of Vandalism or Trespassing		L	L		None.
(AP AREAS					and the second s
2) Asphalt Cap Area	<b>!</b> _			l	
a) General Condition of Asphalt Pavement	<b>┤</b>	<u> </u>		<del>                                     </del>	Minor cracks observed in cap area.
b) Level or Designed Slope Within Pavement	<b>  •</b>				Many depressions in pavement near jersey barriers.
c) Cracks in Pavement					Minor cracks observed in cap area.
d) Erosion on Pavement or Adjacent Areas	+=	╁╌	<del>                                     </del>		Two recently filled areas.
e) Holes/Penetrations in Asphalt Surface f) Bulges in Asphalt Surface		-			None.  Concrete in asphalt near MW 10D.
g) Standing Water - other than above (b)	-	0			Puddle over repaired crack in pavement and along length of concrete barrier. Puddle along jersey barriers.
hj Stability of Slopes and Adjacent Areas	-				None.
i) Groundwater Monitoring Penetrations					None.
j) Damage to Pavement Caused by DRMO Use	-	<u> </u>	-		Yes, roll-offs are causing gouging of pavement.
K) Exposed Cap Components	-	┝┖			None.
STORM WATER FEATURES					
3) Drainage Swale					
a) General Conditions of Western Drainage Swale	-		=	0	Drainage swale is in good condition.
b) Condition of 2-inch Gravel Lining		0	-	0	Lining is in good condition.
c) Amount of Siltation within Swale					None noted.
AREA OF INSPECTION	1		F		NOTES AND COMMENTS
	1		5	1	
	ĺ		NCEN	ZON .	
	1	ž	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	
	ē	POES NOT APPLY	SMAD	SMAT	
	INSPECTED	OES N	EPAIR	COM	
			# W	22	
4) Concrete Catch Basin	_	_	_		
a) General Condition of Northern Catch Basin	╂┋╌				Generally in good condition.
b) Condition of Grate Assembly			-		None.
c) Amount of Siltation within Catch Basin	1			ļ	Approximately 8 inches of sediment.

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 2 of 6

				_	
5) Culvert Outfall					
a) General Condition of Discharge Pipe	-		=		Generally in good condition.
bj Amount of Siltation within Pipe	. =		-		None.
c) Condition of Outlet Flare and Riprap Outfall	-		-		None.
6) Thames River Riprup					
a) General Condition of Riprap Protection			-		Fragmites growing along gravel river side of jersey barriers.
MONIFORING WILLS					
7) 6MW1S					
a) Condition of Protective Casing/Riser					Rusty.
b) Condition of Well Cover	-		-		Rusty.
c) Condition of Well Lock					Lock is in good condition.
d) Condition of Well Concrete Pad			-		Cracking partially covered.
8) 6MW2S					
a) Condition of Protective Casing/Riser					Rusty.
b) Condition of Well Cover					Rusty.
c) Condition of Well Lock				-	Russy.  Lock is in good condition.
d) Condition of Well Concrete Pad					Covered by vegetative growth.
a) Condition (i) well Concrete Fau		l —		<b></b>	Covered by vegetative growns.
9) 6MW2D		<del>                                     </del>	<del> </del>		
•			_ '		
a) Condition of Protective Casing/Riser	-			-	Slightly bent but does not interfere with sampling activities. Possibly hit by orange dumpsters.
b) Condition of Well Cover		-		-	None.
c) Condition of Well Lock	+-				None.
d) Condition of Well Concrete Pad	<b></b> -		<del>-</del>	├	Covered by gravel and vegetative.
A CAMPAGA A LA LA LA CAMPAGA A		<b></b>	<del> </del>		
10) 6MW3S (Abandoned near 6MW11S)	_	l _	l _		
a) Condition of Surface Surrounding Location	_	<u> </u>			Generally in good condition.
·			-	<b> </b>	
II) 6MW3D (Abandoned near 6MW11D)	1_	l _	l	l	
a) Condition of Surface Surrounding Location					Generally in good condition.
<u> </u>	<u> </u>			<u> </u>	

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 3 of 6

AREA OF INSPECTION			ı	T	NOTES AND COMMENTS
			<u> </u>		
			REPAIRSMAINTENANCE NOT RECOMMENDED	8	
			XVX.	NAN.	
		DOES NOT APPLY	E CE	REPAIRSMAINTENANCE RECOMMENDED	
	INSPECTED	NOT.	RS/M/	RSAM	
	ZA PE	S30	KPAII FCON	ECO.	
	_ =		# #	~ ~	
2) 6MW4S					
a) Condition of Protective Casing/Riser					Unable to locate.
b) Condition of Well Cover					
c) Condition of Well Lock					
d) Condition of Well Concrete Pad					
3) 6MW5S					
a) Condition of Protective Casing/Riser			0		Unable to locate.
b) Condition of Well Cover					
c) Condition of Well Lock					
d) Condition of Well Concrete Pad					
а) Сонатон ој неи Сонстене Рай		<del></del>	<u> </u>		
4) 6MW5D	<u> </u>	<del></del>			
a) Condition of Protective Casing/Riser	+-		-	_	Unable to locate.
b) Condition of Well Cover					
c) Condition of Well Lock			-	-	
d) Condition of Well Concrete Pad		<del>                                     </del>	<del>                                     </del>	<del> </del>	
5) 6MW6S		<del> </del>	<b></b>	-	
	1 🕳				
a) Condition of Protective Casing/Riser	+	-		-	Paint chipping, starting to rest underneath.
b) Condition of Well Cover		<b> </b>		<del> </del>	None.
c) Condition of Well Lock			-		Good.
d) Condition of Well Concrete Pad	-		-		None.
6) 6MW6D				l	
a) Condition of Protective Casing/Riser			-		None.
b) Condition of Well Cover			-		None.
c) Condition of Well Lock	•	. 🗆	-		Good.
dj Condition of Well Concrete Pad			-		Notic.
		<u> </u>			
17) 6MW7S					
a) Condition of Surface Surrounding Well Cover		ם			Covered by puddle, area is depressed into asphalt.
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock	-		-		Reportedly has no lock.

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 4 of 6

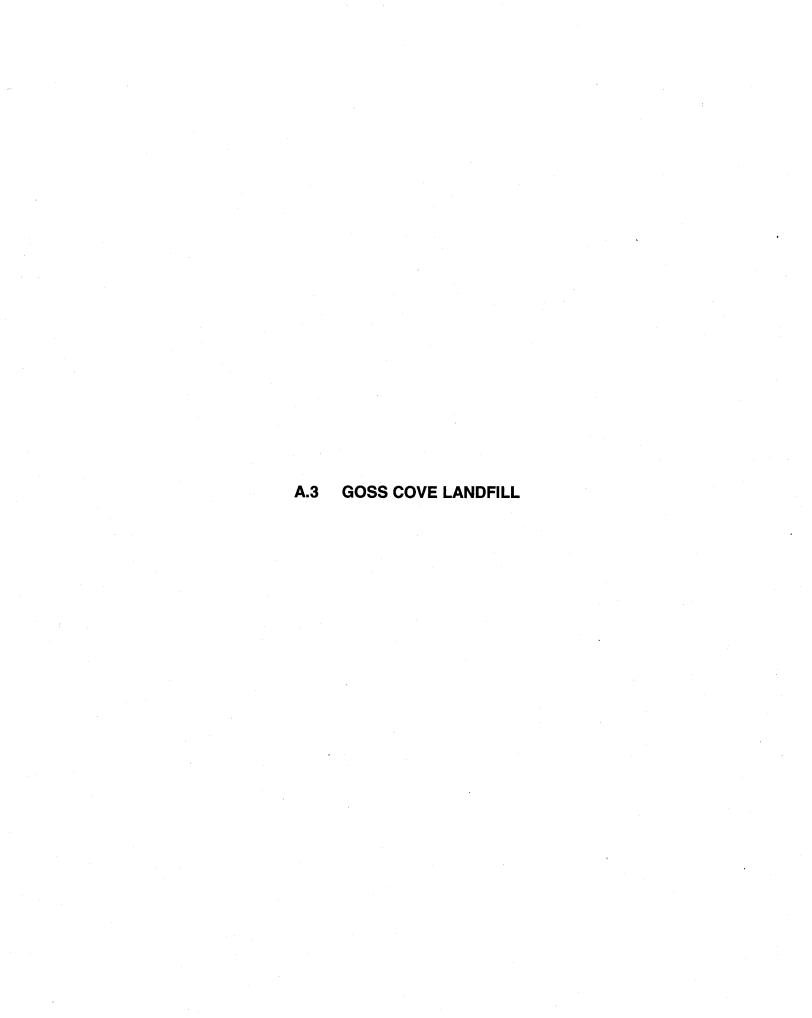
AREA OF INSPECTION					NOTES AND COMMENTS
			<u> </u>		
			ž ¥	¥	
<i>f</i> .			KANC	NANC KAN	
· [		PLY	REPAIRS/MAINTE/SANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	
	1 g	BOES NOT APPLY	MAI	MA (	· ·
	INSPECTED	ON S	VIRS.	3 K	
	N S	900	REP	1 1 2 2	
18) 6MW8S				ļ.	
a) Condition of Surface Surrounding Well Cover				-	Well was located under stored equipment. Sediment build up noted on surface that should be cleaned off.
b) Condition of Flush Mount Well Cover					None.
			-	0	Reportedly has no lock.
c) Condition of Well Lock					Rejustedly lias in total
19) 6MW9S					
a) Condition of Surface Surrounding Well Cover	-				None.
b) Condition of Flush Mourn Well Cover			-		None.
c) Condition of Well Lock	-				Reportedly has no lock.
t) Conunion by wear Lock	<b>†</b>				
	<del> </del>				
20) 6MW10S	l _		١ _	I _	
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock					Reportedly no lock
21) 6MW 10D	<u> </u>				
				l <b></b>	
a) Condition of Surface Surrounding Well Cover					Damsged concrete.
b) Condition of Flush Mount Well Cover	-	0	-		None.
c) Condition of Well Lock	-	-	-		Reportedly has no lock.
			ļ		
22) 6MW11S				1	
a) Condition of Surface Surrounding Well Cover	<del></del>			-	Well has been recourty repaired, under puddle of standing water at time of inspection.
b) Condition of Flush Mount Well Cover	<u> </u>				None.
c) Condition of Well Lock			-		Reportedly has no lock.
		<u> </u>			
23) 6MW11D			I		
			=		Repaired well under puddle
a) Condition of Surface Surrounding Well Cover	<del>                                     </del>			0	
b) Condition of Flush Mount Well Cover	<del></del>	<del></del>			Under puddle.
zj Condition of Well Lock	<u> </u>	0		0	None.
	1	1	F.	t	

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 5 of 6

Adequary of O&M at Site:			
over all OAM practices at the ion are sufficient at this time			
Notes:			
Two seew asphult patches near 6MW11D reportedly filled previous depressions			
		1.00	
			water the same and
Sedimentation around jursey barriers at western perimeter is restuating surface drainage. Depressions around jussey betwiers at western perimeter and 6MW75 should be repaired. The minor creak behaved thoughout capped are also should be sealed. Prices of concrete embedded in cap neur 6MW10D should be removed and aughsts surface fregotation provings in the presentation should be removed.			
Depressions around jossey burviors at western perimeter and 6MWTS abould he repaired. The minos exacks observed throughout capped ares should be scaled. Price of concrete embedded in cap near 6MW18D should be removed and naphait surfac	e repaired.		
Depressions around jessey burviers at women perimeter and 6 MWTS should be repaired. The minor creaks observed throughout capped area should be sealed. Priese of concrete embedded in cap near 6MW 1010 should be removed and asphali surface Vegetabons growing in rip-map prescribes should be removed. Approximately 5 inches of sodirection to bottom of catch busin should be removed. General business of the of sodirection of catch busin should be removed. Concrete is duranged amound 644W 100, should be replaced. Concrete is duranged amound 644W 100, should be replaced. Untable to locate meniosing well 64W4S, locate well or consider it that/standaned. Untable to access wells 64W4S and 64gW950 does no security audit-inclines.	e repaired.	Dung	12/5/05
Represides around jossy buviers at vector perimeter and 6MVTS should be repaired.  The mines creak bearned throughout capped are should be sealed.  Price of concrete embedded in cap near 6MV IOD should be removed and suphals surface  Progressions proving in rip-say preservices should be removed.  Represidently 8 Surface of software in bottom of catch busin should be removed.  Reduced build sign on 64MVSS should be resourced and keep paties off top of well cover,  Concrete is demanged around 64MV 10D, should be rejected.  Linable to locale menistering well 6MW4S, locate well or consider it lost/standoned,  Unable to access wells-64MVSS and 6MW5D date in security vestifications.  66MVTS is underwater in a depressed area that should be repaired.  Coursesy B. Misoner of Respector	e repaired.	Durch	12/5/05
Repressions around jossey burviers at vectors perimeter and 6 MWTS should be repaired.  Where miner crecks observed throughout capped are should be reached  here of concrete embedded in cap neur 6MW 10D should be removed and suphals surface  fregistations proving in rip-ray preserving about the removed and suphals surface  fregistations proving in rip-ray preserving about the removed.  Reduncate habits ago on 64 WWS should be removed and keep paties of top of well cover,  Concrete is derrayed around 648W 10D, should be replaced.  Unable to be captured around 648W 10D, should be replaced.  Unable to be captured around 648W 50 and 648W 15D date as security vertifications.  664W 15 is underwater in a depressed area that should be repaired.  Countries by D, Moorer, 64, 9-3E.	a required.	Signmen of diagonal dar performed, and that the stems named on this sectives established for the tile.	12/5/05
Oppositions around jossey burviers at vectors perimeter and 6 MWTS should be repaired.  The minor creaks beavered throughout capped are should be sealed.  Prices of concrete embedded in cap near 6MW10D should be removed and suphals surface  Progressions proving in rip-say preservings should be removed and suphals surface  Progressions proving in rip-say preservings should be removed and the parties of top of well cover,  Deduction build say on 64W95 should be removed and keep pailts off top of well cover,  Coverings is themself assumed 64W 10D, should be replaced.  Linable to locals menistoring well 64W45, boats well or consider it lost/shundoned,  Unable to access wells-64W95 and 64W950 due to security estimations.  66WW5 is underwater in a depressed area that should be repaired.  Covering by D. Moorie, 64, P.B.  Phated Name of Insepector  Covering bis Statesmore:  Liberthy certify that a complete and through inspection and evaluation of the tile  hereby certify that a complete and through inspection and evaluation of the tile.	a required.	Signment of dispeller for performed, and that the stime moved on this certives established for the site.	12/5/05 Jr
Depressions around jersey burviers at vector perimeter and 6 MWTS should be repaired.  Whe miner crecks observed throughout capped are should be reached.  Where of crocrete embedded in cap near 6MW 10D should be removed and asphalt surface  Progressions proving in rip-map preserving should be removed and asphalt surface  Progressions proving in rip-map preserving should be removed.  Reduced halfs spin on 6MWSS should be removed and keep paties off top of well cover.  Concrete in derraged around 644W 10D, should be replaced.  Linable to became according well 644W 10D, should be replaced.  Linable to became according well 644W 10D, should be replaced.  Linable to became according well 644W 10D, should be replaced.  Linable to access wells 654W 952 and 848W 953 due to according well formed.  Linable to access wells 654W 953 and 848W 953 due to according well-frame.  664W 955 is underwater in a depressed area that should be repaired.  Contracted from the complete and through inspection and evaluation of the late  In earthy certify that a complete and through inspection and evaluation of the late  Inspection form have been assessed with respect to the latent of the implemented  Robert J. Tess, PE  Proceed Power of thems tangeneer	a required.	performed, and that she films named on this sectives established for the tile.  J D Concar Printed Name of ISSN 341.001 International Page 1853 341.001 Intern	12/5/05 Jr
Depositions around jossy burviers at vector perimeter and 6 MWTS should be repaired.  The minor creaks beened throughout capped are should be sealed.  Price of concrete embedded in cap near 6MW10D should be removed and suphals surface  Programs proving in rip-sup preservings abordly be removed and suphals surface  Programs proving an embedded in cap near 6MW10D should be removed.  Beddenies build sign on 64WSS should be resourced and keep paillets off top of well cover,  Concrete is demanged around 64W 10D, should be replaced.  Linable to locate menistrate well 64WMS, boasts well or consider it lost/shandoned,  Unsable to locate menistrate well 64WMS, boasts well or consider it lost/shandoned,  Unsable to access wells.64WMS and 696WMSD due to security restrictions.  66MWTS is underwater in a depressed area that should be repaired.  Country by D. Moonie, 64, P.B.  Plated Name of Insepector  Country by D. Moonie, 64, P.B.  Plated Statessavet  I hereby certify that a complete and through inspection and evaluation of the tile  Inspection form have been necessed with respect to the latent of the Implemented  Robert J. Tess, PE	a required.	Signature of disagraphic Alice  performed, and that the Mans needed on this  performed, and that the Mans of NSB MILON 1889-  Pelasted Name of NSB MILON 1889-	12/5/05 Jr.
Depositions around jossy burviors at vocatin perimeter and 6 MWTS should be repaired.  The miner crecks observed throughout capocal area should be sealed.  Price of concrete embedded in cap near 6MW 10D should be removed and suphals surface  fregistation proving in rip-ray presention should be removed and suphals surface  fregistations proving in rip-ray presention should be removed.  Beddinger build by on 64 WWS should be removed and keep pullets off top of well cover,  Concrete is derivinged around 648W 10D, should be replaced.  Unable to income in centioning well 65MW45, locate well or consider it traditional  Unable to access wells-65MW35 and 648W350 due to access wells-65MW35 in underwater in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be repaired.  Contract in a depressed area that should be removed and evaluation of the late  targetion form have been assessed with respect to the latent of the Implemented   Digitally signed by Robert J. Toss,  PE	a required.	Signature of NSB-NLON HEP  Poliside Name of NSB-NLON HEP  Signature of NSB-NLON HEP  Signature of NSB-NLON HEP  Signature of NSB-NLON HEP  Signature of NSB-NLON HEP Men.	Jr 2 Dec 05

#### INSPECTION CHECKLIST SITE 6 - DRMO Page 6 of 6

Provide additional notes or sketch as needed:	



and the second s		YN	COL	Car	ION CHECKLIST
	S	ITE	8-	GOS	S COVE LANDFILL
SITE NAME: Site 8 - Goss Cove Landfill (OU					
EPA ID: CTD980906515					
SITE LOCATION New London County, CI			*		
EPA REGION: <u>Region 1</u> REMEDY AT SITE: <u>Landfill Cover, Institutio</u>	nal C	ontr	ols,	Mon	toring
RESTREE IN STREET					
DATE: 4-Jun-2003 INSPECTOR/COMPANY Tim Nichols,	DE.	GRC(	_		
INSPECTOR/COMPANY Tim Nichols,	2 - 12 - 7	3,5,5,5	<u> </u>		
WEATHER CONDITIONS: Temperature:		62			
Weather:	سننسبند	Ra N	-		
Other:			<u></u>		
TYPE OF INSPECTION: Annual Inspec					
□ Post-Major \	Veath	er E	vent	Inspe	ction
☐ Re-Inspection☐ Other		Jenic	esiii i	LETTIS	
	<del></del>	,			
			20	<b>4</b>	
			REFAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	
rational design of the control of th		n.v	CND	ž a	
AREA OF INSPECTION	9	DOES NOT APPLY	refairs/maintena) Not recommended	REPAIRS/MAINT RECOMMENDED	NOTES AND COMMENTS
	INSPECTED	ON	TRECT	MA	
en en en en en en en en en en en en en e	NSK	DOE	E L	REPA	
TORSTON (DEPLOYORS OF THE PARTY					
1) Security Fencing, Gates, and Signs					West section of fencing, adjacent to Nautilus pier, missing some screen ties to the upper tension
		O	0	-	West section or fencing along the west perimeter, north end of site, is missing upper tension wire.  Missing screen files at wast fence section near north east corner.
a) Fence at West Limit (P & W RR)	-	0		-	And the state of t
b) Fence at Northern Limit		<u> </u>		<del> </del>	None.
c) Fence at Northeast Limit at Bedrock Outcrop	-	<u>-</u>	0	-	Some potes (3) slightly bent due to snow-plow or other vehicle.  Fencing at east perimeter (north of entrance) missing some bottom screen ties, a section of screen is
d) Fence at East Limit Near Main Entrance		ם	0	-	bent, and a portion of the upper tension wire is loose.  Vines growing on eastern section of sewage pump station fence.
e) Fence at South Limit at Sewage Pump Station	-	0	-	0	
f) Fence at South Limit at Nautilus Access Pier	-	0	<del>-</del>	-	None. Mangate at gas vent M compound is low and dragging on ground.
g) Fence at Gas Vents at East Limit	-	0	-	10	
h) Locked Entrance or Secure Access	-	0	_ 	-	None.  Mangate focated along western perimeter at north end of site is misaligned and does not tatch.
i) Man Gate Near Li Pole #12		0	-	0	None.
j) Man Gate Near Li Pole *G		-	0	D	No signage posted.
k) No Trespassing and Security Signs	-	D	a		See Item 1d. May be a result of treepassing.
i) Indications of Vandalism or Trespassing			T		•
LANDSCAPING PRATURES					
2) Concrete Pavers			1		
a) General Condition of Pavers	-		=	D	None
b) Level or Designed Slope Within Paver Surface	-		-		None
c) Standing Water - other than above (b)	-	u	-		None.
	1_	_	1		
3) Concrete Curbing (Traffic Areas)					One section of concrete curbing has been damaged at the northeast portion of the parking area.
a) General Condition of Curbing	-		<del>  -</del>		
b) Indication of Cracked Curbing	-		10		Seu Rem 3a.
c) Indication of Dislodged Curbing	-		-	10	None
d) Indication of Heaved Curbing	-	0	-	10	None.
j ·	1	1	.1	1	and the control of th

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 2 of 12

AREA OF INSPECTION	DISPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
4) Granite Curbing (Exhibit and Paver Areas)					À .
a) General Condition of Curbing	-	<u> </u>	-	<u> </u>	None
b) Indication of Cracked Curbing	-	<u> </u>	-	<u> </u>	None.
c) Indication of Distadged Curbing	-	0	-		None
d) Indication of Heaved Curbing	-	O	=	D	None.
5) Concrete Sidewalks a) General Condition of Sidewalks		0	-	п	None.
b) Indication of Cracked Sidewalks	-	O		П	None
c) Indication of Dislodged Sidewalks	-	0		D	None
d) Indication of Heaved Sidewalks	-	В	-	O	None
Submarine Displays (Four Total)      Condition of Foundation Supports	-	o	0	-	Significant spauling of the two concrete haunches for the west sub display was noted. Corrosion of the reinforcing steel was evident due to staining and the concrete could be removed in small sections.
b) Interface at Ground Surface and Foundations	-	o	-	D	None.
c) Observation of Exposed Cap Components		o	-	0	None.
C) Giser tanda of Espaina Cap Components				1	
7) Trailer Foundation (Maintenance Bldg.)  a) Condition of Foundation Support		0		D	None.
b) Interface at Ground Surface and Foundation	=	0	*		None.
c) Observation of Exposed Cap Campanents	-	а		п	None.
8) Missile Hatch Display		0		a	
a) Condition of Foundation Support	+-	10	1=	10	None.
b) Interface at Ground Surface and Foundation	+=	10	+=	-	None.
c) Observation of Exposed Cap Components	+-	1-	┼╌	+-	None.
9) Gun Display	+-	+	十	+	
a) Condition of Foundation Support	-	D			None.
b) Interface at Ground Surface and Foundation		В	-	0	None.
c) Observation of Exposed Cap Components	-	П	=	D	None.
d) Center Island Flagpoles (Foles A. B., and C)	-	П	-	a	None.
e) Retaining Wall on West Side		G	-	0	None.
by appropriate to the control of the	1	1	1	1	
10) Retaining Wall on West Side	1	1			
a) Condition of Foundation Support	-		-	D	None.
b) Interface at Ground Surface and Foundation	-	a	-	0	None.
c) Observation of Exposed Cap Components	-	0	-	D	None
The state of the s		1	1	1	

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 3 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
11) Flagpole *A					
a) General Condition of Flagpole	-	10	-		None.
by Condition of Foundation Support	-		-	0	None
c) Interface at Ground Surface and Foundation	-	D	-	0	None.
d) Observation of Exposed Cap Components	-	D	-		None.
12) Flagpole *B	1	$\vdash$	T	T	
a) General Condition of Flagpole	-	0	=	O	Ncne.
b) Condition of Faundation Support		0	-	D	None.
c) Interface at Ground Surface and Foundation	-	D	-	0	None:
d) Observation of Exposed Cap Camponenis	-	0	-	0	Nova.
13) Flagpole *C	1	T		T	
a) General Condition of Flagpole	-	0	-	D	None.
b) Condition of Foundation Support	-	O	*	O	None.
c) Interface at Ground Surface and Foundation	-	D	-	D	Norse:
d) Observation of Exposed Cap Components	-	<u> </u>	-	O	None.
14) Flagpole *D  a) General Condition of Flagpole		0	-	0	None.
b) Condition of Foundation Support	+=	6	1	6	None:
c) Interface at Grosund Surface and Farmdation	╁	10	=	10	Note.
d) Observation of Exposed Cap Components	╬	-	一	-	None.
i5) Flagpole *E	1				
a) General Condition of Flagpole			-	0	None.
b) Condition of Foundation Support	-	0	-	D	None.
c) Interface at Ground Surface and Foundation	-	0	-	0	None.
d) Observation of Exposed Cap Components	-	0	-	0	Norse.
16) Flagpole *P	$\top$	1	$\vdash$		
a) General Condition of Flagpole	-	O	-	0	None.
b) Condition of Foundation Support		G	-	O	None.
c) Interface at Ground Surface and Foundation	=	O	=	D	None.
d) Observation of Exposed Cap Components	•	O		О	Note.
	4-	ļ		<u> </u>	
17) Picnic Area					
a) Condition of Foundation Support	-	0	-	O	None.
b) Interface at Ground Surface and Foundation	-	п	=	<u> </u>	None.
c) Observation of Exposed Cap Components	-	0	-	0	None.
		1		L	

# INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL

Page 4 of 12

a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  19) Light Pole #2  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  20) Light Pule #6  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  21) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Foundation Support	0000000		0	None.
a) Condition of Foundation Surface and Foundation  c) Observation of Exposed Cap Components  19) Light Pole #2  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  20) Light Pule #6  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  11) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  11) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	000	•	D	
b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  19) Light Pole #2 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  28) Light Pule #6 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation	0 0	-	+	None.
29) Light Pole #2  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  20) Light Pule #6  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  11) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  11) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	0 0	-	10	
a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Esposed Cap Components  29) Light Pule #6 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation	o	<u> </u>		None.
b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  28) Light Pule #6 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation	o		†	
b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  28) Light Pule #6 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  21) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation	+		O	Nigne.
c) Observation of Exposed Cap Components  29) Light Pule #6  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  21) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation		-	O	None.
28) Light Pule #6  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation  c) Observation of Exposed Cap Components  21) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	1	•	В	None:
a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation	T			Hardway and the second of the
a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation		T		
b) Interface at Ground Surface and Foundation c) Observation of Exposed Cap Components  11) Light Pole #7 a) Condition of Foundation Support b) Interface at Ground Surface and Foundation		-		None.
c) Observation of Exposed Cap Components  21) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	a	-	В	None.
21) Light Pole #7  a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	0	-	D	None.
a) Condition of Foundation Support b) Interface at Ground Surface and Foundation				
b) Interface at Ground Surface and Foundation				
b) Interface at Greate Surface and Foundation	O	-	O	None
c) Observation of Expased Can Components	D	=	O	Nane
		-	<u> </u>	None.
	1	$\vdash$	-	
22) Light Pole #8	0		П	None.
a) Condition of Foundation Support  b) Interface at Ground Surface and Foundation	D		D	None.
c) Observation of Exposed Cap Components		-	ū	None.
C Contraction of Exposer City Components				
23) Light Pole #9		Π		
a) Condition of Foundation Support	D	=	o	None.
b) Interface at Ground Surface and Foundation	a	**	ū	None
c) Observation of Exposed Cap Components	O	-	o	None
24) Light Pole #10				
a) Condition of Foundation Support	O	-	O	None.
b) Interface at Ground Surface and Foundation	п	-	O	None.
c) Observation of Exposed Cap Components	0	-	D	Nong.
	-	-	<del>                                     </del>	
25) Light Pole #11	_	-		
a) Condition of Foundation Support	0	-	0	Norie.
b) Interface at Ground Surface and Foundation		_	10	None.
c) Observation of Exposed Cap Components	-		13	

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 5 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
26) Light Pole #12					
a) Condition of Foundation Support	-	a	-	D	None.
b) Interface at Ground Surface and Foundation	-	0	-	0	None.
c) Observation of Exposed Cap Components	-	D	-	D	None.
27) Light Pole #14	+		1		And the second s
a) Condition of Foundation Support		O		ם	None.
b) Interface at Ground Surface and Foundation		O	-	a	None.
c) Observation of Expused Cap Components		O	-		None
			T		
28) Light Pole *G	1				
a) Condition of Foundation Support	-	D			None:
b) Interface at Ground Surface and Foundation	-	D.	=	п	None.
c) Observation of Exposed Cap Components	-	O		o	None.
29) Light Pole *H					
a) Condition of Foundation Support	=	G		D	None.
b) Interface at Ground Surface and Foundation	-	0	-	0	None:
c) Observation of Exposed Cap Components	-	0	-	u	None.
30) Light Pole *I	+-		-		
a) Condition of Foundation Support		0		D	None.
b) Interface at Ground Surface and Foundation.		ū	-	O	None.
c) Observation of Exposed Cap Components	-	o		О	None.
31) Light Pole *K			T	Γ	
a) Condition of Foundation Support	-	B	-	D	None.
b) Interface at Ground Surface and Foundation		<b>a</b>		u	None.
c) Observation of Exposed Cap Components	-	a	*	a	None.
	-		-	_	
32) Light Pole *S		а			
a) Condition of Foundation Support	-	0	-		None.
b) Interface at Ground Surface and Foundation	-	0	-	0	None.
c) Observation of Expased Cap Components	+-		<u> </u>	-	None.
33) Irrigation System					
a) Condition of Sprinkler Heads	-	D	-	Π,	None.
b) System Operation	<b>D</b>	D	-	Ω.	Not observed - system being maintained by base personnul.
c) Condition of Pump and Controls	а		-	0	Not observed - system being maintained by base personnel.

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL

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AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE, NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
				30500	
34) Asphalt Surface Cap	-	a	-	D	
a) General Condition of Asphalt Povement		o		0	Spod cendition.
b) Level or Designed Slope Within Pavement	-	6		0	None
c) Cracks in Pavement	=			0	None.
d) Erosion in Pavement or Adjacent Areas	-	0	=	0	None.
e) Holes/Penetrations in Asphalt Surface	-	D		0	None.
f) Bulges in Asphalt Surface	-	0	-	0	Nore.
g) Standing Water - other than above (b)	-	0		0	Nane.
h) Stability of Slopes and Adjacent Areas	-	0	=	0	None:
i) Groundwater Monitoring Well Penetrations	-	0	-	<u></u>	None.
j) Damage to Puvement Caused by Use	-	0		0	Note.
k) Exposed Cap Components	_			<u> </u>	None
35) Grass Surface Cap a) General Condition of Vegetation	•	0	0	=	Some invasive weeds noticed.
b) Level or Designed Slope Within Grass Area	-	0	-	0	None.
c) Erasion in Vegelation or Adjacent Areas	-	0	-	D C	None.
d) Standing Water - other than above (b)	-		-	0	None.
e) Stability of Slopes and Adjacent Areas	-	0	-	O	None.
f) Groundwater Monitoring Well Penetrations	-		-	0	None.
g) Damage to Pavement Caused by Museum Use	-	o o	-		None.
h) Exposed Cap Components	-	D	-	<u> </u>	None.
	ROSSILVES	analesia	sanasan	sound	
STORMANDERSEATURES					
36) Box Culvert (Road to River)				a	
a) Condition of Upper Auretian Box - Exterior	ļ	0	-		None.
b) Condition of Upper Junction Box - Interior	-	0	-	<u> </u>	None.
c) Condition of Box Culvert - Interior Sections	-	0	-	0	None.
d) Condition of Outfall	-	0	0	-	Some debris floating in containment boom.
	<del> </del>	<u> </u>	<u> </u>	<del> </del>	
37) Catch Basin 1 (CB 1)					
a) General Condition of Inlet	-	0	_		Noce,
b) Sedimens Within Inlet	-	u	-	C	None.
c) Obstructions at Pipe Inlets or Outlets	-	0	-	0	None.
			_	_	
38) Catch Basin 2 (CB 2)					
a) General Condition of Inlet	=	0	-	D	None.
b) Sediment Within Inter	-	0	-	0	Hore.
c) Obstructions at Pipe Inlets or Outlets	-	O		0	None

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 7 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
39) Catch Basin 3 (CB 3)					
a) General Condition of Inlet	-	0	-		None.
b) Sediment Within Inlet		D	-	0	None.
c) Obstructions at Pipe Inlets or Outlets	-	D	-	D	None
40) Catch Basin 4 (CB 4)		-	-	<del>                                     </del>	
a) General Condition of Inlet		0			None,
b) Sediment Within Inlet	-	ם	=	a	None.
c) Obstructions at Pipe Inlets or Outlets		o	-	o	None
C) Ossiruations at 1 the times of Outres	+-			$\vdash$	
41) Catch Basin 5 (CB 5)					
a) General Condition of Inlet		0		D	None
and the second s			=		
b) Sediment Within Inlet	-	а	_	<u> </u>	None.
c) Obstructions at Pipe Inlets or Outlets				<del>                                     </del>	None:
42) Catch Basin 7A (CB 7A)					
a) General Condition of Inlet		<u></u>	-	O	None,
b) Sediment Within Inlet	-	D	-	0	Nane.
e) Obstructions at Pipe Inlets or Outlets		0	-		None.
43) Catch Basin 7B (CB 7B)		-			
a) General Condition of Inlet	-		-	0	None.
b) Sediment Within Inlet	- 44	a	-	Ð	None.
c) Obstructions at Pipe Inlets or Outlets	-	0		G	None.
44) Catch Basin 8 (CB 8)		a		_	Name to the state of the state
a) General Condition of Inlet		<u></u>	_	0	None.
b) Sediment Within Inlet		0		6	None.
c) Obstructions at Pipe Inlets or Outlets	-   -	-	-	-	Nona.
45) Catch Basin 9 (CB 9)	:			T	
u) General Condition of Inlet	-	O			None.
b) Sediment Within Inles	- 100	D	**	D	None.
c) Obstructions at Pipe Inlets or Outlets	-		-	П	None.
Service Control of th	1		<b> </b>		
46) Yard Drzin 6A (YD #6A)	1				
a) General Condition of Inlet	-	D	-	Π.	None.
b) Sediment Within Inlet	-	П	-	a	None,
c) Obstructions at Pipe Inlets or Outlets	-	0			
C) Cossinctions at 1 the times of Outlets				1	None.

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 8 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
47) Yard Drain 6B (YD #6B)	_		_		
a) General Condition of Inlet	-	<u>-</u>	-	0	None.
b) Sediment Within Inles	-	<u> </u>		0	NONE,
c) Obstructions at Pipe Inlets or Oullets	-	D	-	0	None.
48) Yard Drain 7C (YD #7C)					
a) General Condition of Inter	-		=	O	None.
h) Sadiment Within Inlet	-	0	-	0	Name.
c) Obstructions at Pipe Inlets or Outlets	=	O		D	Note:
49) Yard Drain 11 (YD #11)					
a) General Condition of Inlet	=	0	-	O	Nicrop.
b) Sediment Within Inlet		П		D	None.
c) Obstructions at Pipe Inlets ar Guilets		0	=	0	None.
50) Yard Drain 11A (YD #11A)		$\vdash$			
a) General Condition of Inlet	-	0	-	0	None.
b) Sediment Within Inlet	-	0	-	0	None.
c) Obstructions at Pipe Inlets or Outlets	-	0	-	0	Norie.
51) Yard Drain 13 (YD #13)					
a) General Candition of inlet		0		O	None.
b) Sediment Within Inlet			185	O	None.
c) Obstructions at Pipe Inlets or Outlets		D	-	D	None.
GAS VEXTS					
52) Gas Vent *L					
a) Condition of Riser and Top Section	-	0	-	0	None.
b) Condition of Screen	-	0	-	0	None.
53) Gas Vent *M					
a) Condition of Riser and Top Section	-	0	-	<u>n</u>	Norve.
b) Camilition of Screen	-	a	-	0	None.
	-	-	-		
54) Gas Vent *N	_		_		
a) Condition of Riser and Top Section	-		-	0	None
b) Condition of Screen			-	0	None.
	<u> </u>				

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 9 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMEMBED	
MONITORING WELLS					1
55) 8MWI	_	_	_	_	
a) Condition of Surface Surrounding Well Cover	-	<u></u>	-	0	None.
b) Condition of Flush Mount Well Cover		0	-	0	None.
e) Condition of Well Lock	-	-	_	-	None.
56) BMW2S			<del>                                     </del>		
a) Condition of Surface Surrounding Well Cover		O	*	O	None.
b) Condition of Flush Mount Well Cover		D		O	None.
c) Cardition of Well Lock		а		<b>G</b>	None
	<b>†</b>				
57) 8MW2D					
a) Condition of Surface Surrounding Well Cover	-	O			None.
b) Condition of Flush Mount Well Cover	-	П	•		None.
c) Condition of Well Lock	-	0	=	<u> </u>	None.
58) 8MW3					
a) Condition of Surface Surrounding Well Cover	-	0	-	0	None.
b) Condition of Flush Mount Well Cover	-	0	-	0	None
c) Condition of Well Lack	<b> -</b>	0	-		None.
59) 8MW4	<del> </del>	-	<u> </u>	_	
a) Condition of Surface Surrounding Well Cover		0	-	n	None.
b) Condition of Flush Mount Well Cover		D		O	Norae.
c) Candition of Well Lock	-	o	=	ū	Nane.
60) 8MW5S					
a) Condition of Surface Surrounding Well Cover	-	D	-	D	None.
b) Condition of Flush Mount Well Cover	-	o	-	O	None.
c) Condition of Well Lock	-	O	•	D	None.
	<u> </u>				
61) 8MW6S				ĺ	and the second s
a) Condition of Surface Surrounding Well Cover	=	0	-	0	None.
h) Condition of Flush Mount Well Cover	-	D	-	n	None.
c) Condition of Well Lock	-	0	-	0	None.
	<u> </u>				
62) BMW6D	_		_		
a) Condition of Surface Surrounding Well Cover	-	0	-	-	None.
by Condition of Flush Mount Well Cover	-	0	-	0	None.
c) Condition of Well Lock	-	D	=	D	None.
	Ļ		<u> </u>		

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 10 of 12.

AREA OF INSPECTION	DISPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE	REPAIRSMAINTENANCE RECOMMENDED	NGTES AND COMMENTS
63) 8MW78 a) Condition of Surface Surrounding Well Cover	-	D	-	D	None.
b) Condition of Flush Mount Well Cover		D	-	D	None.
c) Condition of Well Lock	•	a	-	п	None.
64) 8MW8S  a) Condition of Protective Casing	-	o	-	٥	None
b) Condition of Well Cover	-	D		O	None
c) Candition of Well Lock	-	O	-	D	None
d) Condition of West Protection - Bollards	-	D	-	D	None.
65) MW8D  a) Condition of Protective Casing		n	-	0	None.
b) Condition of Well Cover	-	B		В	None
r) Condition of Well Lock	-	o	-	a	None.
d) Condition of Well Protection - Bollards		a	-	0	None.
66) 8MW98 a) Condition of Surface Surrounding Well Cover	•	a	-	o	Nane.
b) Condition of Flush Mount Well Cover		a	-	D	None.
c) Condition of Welt Lock	-	o	•	P	None.
67) 8MW10S  a) Condition of Surface Surrounding Well Cover		0	•	0	None.
b) Condition of Flush Mount Well Cover	-	0	=	0	None.
c) Condition of Well Lock	•	0	-	0	Norie.
68) HNUS-23 (Tank Farm) a) Condition of Prosective Casing	-	0		0	None.
b) Condition of Well Cover	-	D	-	D	None.
c) Condition of Well Lock	-	D	-	0	None
d) Candition of Well Protection - Bollards		0		0	None:

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 11 of 12

Adequacy of O&M at Site: (Discuss issues and observations related to the impl remedy.)	iomentation and scope of O&M proces	lures. In particular, discuss	their relativeship to the c	surrent and long-term pr	otectiveness of the
In general, the landfill cap system is in good of capon a routise basis. Some minor deficience	ondition and is functioning as desi es should be corrected as noted or	goed to meet the long-ter Table 1-1, Deficiency L	m remedial requirements	ts. The base personne	are maintaining the
Nutes: [Discuss and clarify any cumments ar observations	walabad sai shiir kumansistani Y			atagan maga kapa kabuman manan manan manan kabuman kabuman manan kabuman kabuman kabuman kabuman kabuman kabum	
None					
en en en en en en en en en en en en en e		en anna 'e e e e e e e e e e e e e e e e e e e			
Deficiencies/items Requiring Corrections: (Discuss shi items that were deficient during the his action.)  See attached Deficiency Log (Table i-1) for r		ras for the defectors from - s	uch as confinued monitori	ing and inspection or rep	air and further remedial
				· ·	
Timothy D. Nichols, P Printed Name of Insper		- Just	Signature of Ins	they for	iong Nilhols
A CONTROL OF THE PARTY OF THE P		managana managana managana managana managana managana managana managana managana managana managana managana ma			J
Certification Statement:  I hereby certify that a complete and through inspect ussessed with respect to the intent of the implement	ction and evaluation of the site and lin led remedy and the remedial action of	plemented remedy has been spectives established for the	performed, and that the it site.	ems noted on this inspect	ion furm have been
Printed Name of O&M Er	nginoer	nagen paragraphic selection of the paragraphic selection of the selection	Printed Name of NSB-	NLON IRP Manager	
				and the second s	
Signature of O&M Enginee	er / Date		ignature of NSB-NLO	N IRP Manager / Date	

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 12 of 12

See attached alto map (Figure 1-1).	Provide additional notes or sketch of site as needed:	
	See attached site map (Figure 1-1).	
	#####################################	
		BE - BE - IN BERT

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 1 of 12

SITE NAME: Site 8 - Goss Cove Landfill (OU5) EPA ID: CTD980906515 SITE LOCATION: New London County, CT EPA REGION: Region 1 REMEDY AT SITE: Landfill Cover, Institution		Monitoring	ž		
		-	,		
Inspection Date: December 29, 2004 INSPECTOR/COMPANY	Scott Har	rding, P.E. /	Nobis		- -
WEATHER CONDITIONS:	Te	Weather	: Ov	15-F ercast	- - -
TYPE OF INSPECTION:	<b>=</b>	Other: Annual In Post-Majo Re-Inpsec		Event Inspe	ection s
		Other			<del>-</del>
			NCE NOT	B <sub>Q</sub>	
AREA OF INSPECTION		T APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
	INSPECTED	DOES NOT APPLY	REPAIRS	REPAIRS	
ASSOCIATIONAL CONTROLS					
) Security Fencing, Gates and Signs			200000000000000000000000000000000000000	<i>Manusana</i>	o alah halipunka desimmenten mataman matamat seri seri memenan mataman mengengan seri seri seri dalah seri men Terapa
a) Fence at West Limit (P&W RR)				<b>=</b> .	Screen ties and upper tension wire are needed in certain locations along the western fence.
b) Fence at Northern Limit	. 🖦				None.
c) Fence at Northeast Limit at Bedrock Outcrop					Some poles have slight bend.
d) Fence at East Limit Near Main Entrance	■.				Fencing at east perimeter (north of entrance) missing some bottom screen ties, a section of screen is bent, and a portion of the upper tension wire is loose.
e) Fence at South Limit at Sewage Oump Station				-	Vines growing on eastern section of sewage pump station fence.
f) Fence at South Gas Vents at Nautlis Access Pier	•				None.
g) Fence at Gas Vents at East Limits					Main gate at gas vent M compound is low and dragging on ground.
h) Locked Entrance or Secure Access	•		-		None.
t) Man Gate Near Lt. Pole #12	-				Main gate located along western perimeter at north end of site is misaligned and does not latch.
j) Man Gate Near Lt. Pole #G					None.
k) No Trespassing and Security Signs	-	-	<u> </u>		None.
l) Indications of Vandalism or Trespassing	<b>I</b>				None.
Concrete Pavers	A Windowsmans	Mindununu	SOMMANDO	AGDITATIONAL	ADDABAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
a) General Condition of Pavers					None.
b) Level or Designed Slope within Paver Surface					None.
c) Standing Water - other than above (a)	-		•		None.
	<del></del>	<del></del>	<u></u>		None.
Concrete Curbing (Traffic Areas)					
a) General Conditions of Curbing			□□		One section of concrete curbing has been damaged at the northeast portion of the parking area.
b) Indication of Cracked Curbing					See item 3a.
c) Indication of Dislodged Curbing					None.
d) Indication of Heaved Curbing					None.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 2 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPARSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
4) Granite Curbing (Exhibit and Paver Areas)			i	-	
		l		l	
a) General Conditions of Curbing				∺	Due to snow cover, could only view 25% of curbing. What was inspected is in good shape.
b) Indication of Cracked Curbing				H	Due to snow cover, could only view 25% of curbing. What was inspected is in good shape.
c) Indication of Dislodged Curbing					Due to snow cover, could only view 25% of curbing. What was inspected is in good shape.
d) Indication of Heaved Curbing	_			<u> </u>	Due to snow cover, could only view 25% of curbing. What was inspected is in good shape.
		_			
5) Concrete Sidewalks	_		_	_	
a) General Conditions of Sidewalks					None.
b) Indication of Cracked Sidewalks		-		-	Crack observed in center sidewalk (see photo).
c) Indication of Dislodged Sidewalks	-			□	None.
d) Indication of Heaved Sidewalks			-		None.
-					
6) Submarine Displays (Four Total)					
	-				Spauling of the two concrete haunches for the west sub display was noted. Corrosion of the reinforcing steel was
a) Conditions of Foundation Support		_			evident due to staining and the concrete could be removed in small sections.
b) Interface at Ground Surface and Foundations	-		-	] [	None.
c) Observation of Exposed Cap Components					None.
7) Trailer Foundation (Maintenance Bldg)					
a) Conditions of Foundation Support					Area covered with snow and access was not available.
b) Interface at Ground Surface and Foundations					Area covered with snow and access was not available.  Area covered with snow and access was not available.
c) Observation of Exposed Cap Components		$\overline{}$	-	-	
of season market of the season					Area covered with snow and access was not available.
8) Missile Hatch Display					
a) Conditions of Foundation Support					None.
b) Interface at Ground Surface and Foundations					None.
c) Observation of Exposed Cap Components					None.
9) Gun Display					
a) Conditions of Foundation Support	-				None.
b) Interface at Ground Surface and Foundations	-				None.
c) Observation of Exposed Cap Components	_				None.
d) Center lland Flagpoles (Poles A, B, and C)					None.
e) Retaining Wall on West Side					None.
10) Retaining Well on West Side		****			
a) Conditions of Foundation Support	-	_	_		None.
b) Interface at Ground Surface and Foundations					None.
c) Observation of Exposed Cap Components					None.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 3 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
11) Flagpole *A					
a) General Condition of Flagpole  h) Conditions of Foundation Support	$\vdash$				In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
b) Conditions of Foundation Support	╁╬╌			-	inspection.
c) Interface at Ground Surface and Foundations d)Observation of Exposed Cap Components			+=	-	
аустов чинот ој Емрозей Сир Сотропени	1	<del></del>		<del>                                     </del>	
12) Flagpole *B					
a) General Condition of Flagpole		0	-		To the second se
b) Conditions of Foundation Support	-	$\vdash$	<b> </b>		In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
c) Interface at Ground Surface and Foundations				-	inspection.
d)Observation of Exposed Cap Components			•	0	
13) Flagpole *C					
a) General Condition of Flagpole					In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
b) Conditions of Foundation Support			•		inspection.
c) Interface at Ground Surface and Foundations					
d)Observation of Exposed Cap Components					
	<b> </b> -	<b></b> _		L	
14) Flagpole *D	_ !	_	_	_	
a) General Condition of Flagpole			-		In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
b) Conditions of Foundation Support			-		inspection.
c) Interface at Ground Surface and Foundations					
d)Observation of Exposed Cap Components					
15) Flagpole *E	<del></del>	<b> </b>	<del>  </del>	ļ	
a) General Condition of Flagpole					In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
b) Conditions of Foundation Support		-	-		inspection.
c) Interface at Ground Surface and Foundations d)Observation of Exposed Cap Components					
а)Оолегчиной од Ехролей Сир Сотронения		<del>-</del>	-		
16) Flagpole *F					
a) General Condition of Flagpole			<b>│                                    </b>		
b) Conditions of Foundation Support			-		In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
c) Interface at Ground Surface and Foundations	-				inspection.
d)Observation of Exposed Cap Components		-			
17) Picnic Area					
a) Conditions of Foundation Support			=		In general the flag poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations			•		inspection.
c) Observation of Exposed Cap Components					
	( )				

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 4 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
	-	<del>                                     </del>	- 22	22	
18) Dumpster Pad			ì		
a) Conditions of Foundation Support			-		None.
b) Interface at Ground Surface and Foundations	•		-		None.
c) Observation of Exposed Cap Components					None.
19) Light Pole #2					
a) Conditions of Foundation Support					In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components					
20) Light Pole #6					
a) Conditions of Foundation Support			-		In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components			-		
21) Light Pole #7	<b>.</b>				
a) Conditions of Foundation Support			-		In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surfcae and Foundations					inspection.
c) Observation of Exposed Cap Components			-		
22) Light Pole #8					1.
a) Conditions of Foundation Support			-		In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components			-		
23) Light Pole #9	1_	_			
a) Conditions of Foundation Support	-				In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations	<del>                                     </del>		-		inspection.
c) Observation of Exposed Cap Components	<del>                                     </del>		-		
24) Light Pole #10	l _	_	_		
a) Conditions of Foundation Support	<del> </del>				In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations	<del></del>				inspection.
c) Observation of Exposed Cap Components			_		
25) Light Pole #11	1_	_	_		
a) Conditions of Foundation Support	-				In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components			_		
	J				

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 5 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
26) Light Pole #12					
A Committee of the Comm		1 _	l _	l _	
a) Conditions of Foundation Support		-			In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations		<u> </u>			inspection.
c) Observation of Exposed Cap Components	1	<del>                                     </del>	<b>├</b> -		
27) Light Pole #14		<u> </u>	<del> </del>		
	-		_		
a) Conditions of Foundation Support	<del>                                     </del>	<del>                                     </del>	╁┋╌		In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations	-		<b>   </b>	-	inspection.
c) Observation of Exposed Cap Components	╁┈	<del>                                     </del>	<del>                                     </del>	┝╌	
28) Light Pole #G	<del>                                     </del>	<del> </del>	<del>                                     </del>		
a) Conditions of Foundation Support	l				
b) Interface at Ground Surface and Foundations					In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
c) Observation of Exposed Cap Components					inspection.
cy deservation by Exposed Cap Components		<del></del>			
29) Light Pole #H	1				
a) Conditions of Foundation Support					In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surfcae and Foundations			-		inspection.
c) Observation of Exposed Cap Components		_			and the state of t
30) Light Pole #I					
a) Conditions of Foundation Support	□		=		In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components	1				
31) Light Pole #K					
a) Conditions of Foundation Support					In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components			-		
32) Light Pole #S					
a) Conditions of Foundation Support					In general the light poles appeared to be in good condition. However, snow cover prevented a thorough
b) Interface at Ground Surface and Foundations					inspection.
c) Observation of Exposed Cap Components			-		
33) Irrigation System	l	_	_		
a) Conditions of Sprinkler Heads					Not inspected due to weather conditions.
b) System Operation					
c) Condition of Pump and Controls	· 🗆		•		

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 6 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) Asphalt Surface Cap					
a) General Condition of Asphalt Pavement					Good condition.
b) Level or Designed Slope Within Pavement	_		-		None.
c) Cracks in Pavement					None.
d) Erosion in Pavement or Adjacent Areas	-	. 🗆	-		None.
e) Holes/Penetrations in Asphalt Surface	-				None.
f)Bulges in Asphalt Surface					None.
g) Standing Water - other than above (b)			-		None.
h) Stability of Slopes and Adjacent Areas					None.
i) Groundwater Monitoring Well Penetration					8MW2S cover significantly damaged.
j) Damage to Pavement Caused by Use					None.
k) Exposed Cap Components					None.
					:
35) Grass Surface Cap					
a) General Condition of Vegetation	=	. 🗆		-	N/A
b) Level or Designed Slope Within Grass Area	-				None.
c) Erosion in Vegetation or Adjacent Areas			-		None.
d) Standing Water - other than above (b)					None.
e) Stability of Slopes and Adjacent Areas	-				None.
f) Groundwater Monitoring Well Penetration					None.
g) Damage to Pavement Caused by Museum Use	-				None.
h) Exposed Cap Components	. 🔳		-		None.
STORM WATER FRATURES					
36) Box Culvert (Road to River)	2000-2012-2013-01	mususaanos	cosmunicación		novembranianieniausususususususususususen elektristerianianiania suuretuutalaisterieteet elektristeristeet kat Tari
a) Condition of Lower Junction Box - Exterior					Only the outfall was inspected. Interior sections were not inspected.
b) Condition of Lower Junction Box - Interior					only the outurn who happened interret sections were not improved.
c) Condition of Box Culvert - Interior Sections			0		, , , , , , , , , , , , , , , , , , , ,
d) Condition of Outfall					No debris observed.
					NO GEORIS COSSELVEG.
37) Catch Basin 1 (CB 1)					
a) General Condition of Inlet			_		
b) Sediment Within Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.  A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					A thorough inspection was performed during the supplement visit in April 2005.
c) Oosh actions at 1 the times of Garles					
38) Catch Basin 2 (CB 2)					
a) General Condition of Inlet		_	_		
b) Sediment Within Inlet				$\exists$	Generally in good condition, however a thorough inspection was not performed during this site visit.
c) Obstructions at Pipe Inlets or Outlets				$\overline{}$	A thorough inspection was performed during the supplement visit in April 2005.
The state of the s					

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 7 of 12

	_				
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
39) Catch Basin 3 (CB 3)					
	۱.,				
a) General Condition of Inlet b) Sediment Within Inlet	+ -	┢╬	╁	┝╬	Generally in good condition, however a thorough inspection was not performed during this site visit.
c) Obstructions at Pipe Inlets or Outlets	-			<del>                                     </del>	A thorough inspection was performed during the supplement visit in April 2005.
to contract and the statem of Canada		<del>                                     </del>			
40) Catch Basin 4 (CB 4)		<b>—</b> —			
a) General Condition of Inlet	_				Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet					A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					As any original properties and personned and appropriate and an appropriate and appropriate an
41) Catch Basin 5 (CB 5)					
a) General Condition of Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet			0		A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					
42) Catch Basin 7A (CB 7A)	<u> </u>		<b>i</b> _		
a) General Condition of Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet	<u> </u>				A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					
An Court Books TH (CD TR)					
43) Catch Basin 7B (CB 7B)	_		_	_	
a) General Condition of Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet					A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets	-	J	┝┶╢		
44) Catch Basin 8 (CB 8)	<b>-</b>				
a) General Condition of Inlet					
b) Sediment Within Inlet				-	Generally in good condition, however a thorough inspection was not performed during this site visit.
c) Obstructions at Pipe Inlets or Outlets					A thorough inspection was performed during the supplement visit in April 2005.
O CONTROL W De LINGS OF CHINGS					
45) Catch Basin 9 (CB 9)				- 1	
a) General Condition of Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet					A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					A distribution was bettermine among the subfraction and it is a second
46) Yard Drain 6A (YD #6A)					
a) General Condition of Inlet					Generally in good condition, however a thorough inspection was not performed during this site visit.
b) Sediment Within Inlet					A thorough inspection was performed during the supplement visit in April 2005.
c) Obstructions at Pipe Inlets or Outlets					

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 8 of 12

AREA OF INSPECTION  AREA O	
47) Yard Drain 6B (YD #6B)	
, , , , , , , , , , , , , , , , , , ,	
Generally in good condition, however a thorough inspection was not perfe	
c) Obstructions at Pipe Inlets or Outlets	2005.
o occuracions at 1 pe inters or ouners	<del>-</del>
48) Yard Drsia 7C (YD #7C)	
Generally in good condition, however a thorough inspection was not perfo	
C) Obstructions at Pipe Inlets or Outlets	2005.
o) cook serious at a file titude of Garlets	
49) Yard Drain 11 (YD #11)	***
a) General Condition of Inlet	
Centerary in good containor, nowever a unorough inspection was not period	
a) Seament within Inlet  A thorough inspection was performed during the supplement visit in April  C) Obstructions at Pipe Inlets or Outlets	2005.
50) Yard Drain 11A (YD #11A)	
a) General Condition of Inlet	
N. C. drawed Philip Late.	
c) Obstructions at Pipe Inlets or Outlets	2005.
51) Yard Drain 13 (YD #13)	
a) General Condition of Inlet	med during this site visit
b) Sediment Within Inlet   A thorough inspection was performed during the supplement visit in April	
c) Obstructions at Pipe Inlets or Outlets	
CAS VENTS	
52) Gas Vent *L	mususuu suus mususutatatatatsi siteesi ji kossiisi
a) Condition of Riser and Top Section	
b) Condition of Screen	
53) Gas Vent *M	
a) Condition of Riser and Top Section	
b) Condition of Screen	
54) Gas Vent *N	
a) Condition of Riser and Top Section	
b) Condition of Screen	

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 9 of 12

AREA OF INSPECTION  MONITORING WELLS	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
55) 8MW1					·
a) Condition of Surface Surrounding Well Cover	•				None.
b) Condition of Flush Mount Well Cover					Well cover missing 1 bolt.
c) Condition of Well Lock	-		•		None.
56) 8MW2S					
a) Condition of Surface Surrounding Well Cover					·
a) Condition of Surface Surrounding Well Cover  b) Condition of Flush Mount Well Cover		-			Minor damage to concrete around well cover.
c) Condition of Well Lock	•				Well cover significantly damaged.  None.
					TVIA.
57) 8MW2D					
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover					Missing 1 bolt.
c) Condition of Well Lock			-		None.
58) 8MW3	$\neg \uparrow$				
a) Condition of Surface Surrounding Well Cover	-				None.
b) Condition of Flush Mount Well Cover	_		-		None.
c) Condition of Well Lock					None.
59) 8MW4					
	_				
a) Condition of Surface Surrounding Well Cover b) Condition of Flush Mount Well Cover		-		<u>.</u>	None.
c) Condition of Well Lock	-	-			Well cover missing 1 bolt. None.
					(NOTE:
60) 8MW5S					
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock	-				None.
61) 8MW6S					
a) Condition of Surface Surrounding Well Cover			_	_	
b) Condition of Flush Mount Well Cover			-		None.
c) Condition of Well Lock	-			]	None.
62) 8MW6D					
a) Condition of Surface Surrounding Well Cover		<u>-</u>			None.
b) Condition of Flush Mount Well Cover				$\neg$	None.
c) Condition of Well Lock		-			None.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 10 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
	<del> </del>	├	+	├	
63) 8MW7S	_	_			
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover	-				None.
c) Condition of Well Lock					None.
64) 8MW8S	<del> </del>		<del> </del>		
	l _		l _	l _	
a) Condition of Protective Casing	-				None.
b) Condition of Well Cover	-				None.
c) Condition of Well Lock	_				None.
d) Condition of Well Protection - Bollards				Ö	None.
65) 8MW8D	L				
65) 8M WOD			1		
a) Condition of Protective Casing			-		None.
b) Condition of Well Cover	-				None.
c) Condition of Well Lock			-		None.
d) Condition of Well Protection - Bollards	-				None.
66) 8MW9S					
a) Condition of Surface Surrounding Well Cover					None.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock					None.
67) 8MW10S					
a) Condition of Surface Surrounding Well Cover	-		-		None.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock	-				None.
					TOTAL .
68) HNUS-23 (Tank Farm)					
a) Condition of Protective Casing	•			_	None.
b) Condition of Well Cover					None.
c) Condition of Well Lock	-				None.
d) Condition of Well Protection - Bollards	-		-		None.
					i voite.

## INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 11 of 12

ROPGINGY OF CREM, at Sile:						
recuss issues and observations related to the implementation and scope of O&M proced stockiveness of the remedy.)	lures. La particular, discuss th	eir relationship to the	e corrent and long	-term		
- Company (						
general, the insulfill cap system as in good condition and is functioning as designed to meet th						
we maintenance released deficiences should be corrected as noted above.	ic loug-term temedial rediment	nis				
as now inches.				2.		
		•				
	•					
lokes:						
Discuss and clarify any comments or observations related to this inspection.)				•		
			2.7			
¢						
	•					
	•					
focuss all items that were deficient during the inspection. Also provide recommendation of further resected action.}			Oring and inspecti	an or repair		
Nocuss all items that were deficient during the inspection. Also provide recommendation of further resection action.}			oring and inspecti	en or repoir		
Necuss all items that were deficient during the inspection. Also provide recommendation of further recording action.)			Dring and inspecti	an or repoir		
Nocuss all items that were deficient during the inspection. Also provide recommendation of further resection action.}			oring and inspecti	en or repair		
eficiencies/leans Requiring Corrections; Nocuss all iceme that were deficient during the inspection. Also provide recommendation of further resocial action.) 1 soc attached Corrective Action Plan (Appendix A) on deficiencies, plansed corrective meas			Dring and inspecti	en or repair		
Nocuss all items that were deficient during the inspection. Also provide recommendation of further resection action.}			oring and inspecti	en or repair		
Necuss all items that were deficient during the inspection. Also provide recommendation of further recording action.)			oring and inspecti	an or repoir		
focuss all items that were deficient during the inspection. Also provide recommendation of further resected action.}			oring and inspecti	an or repair		
focuss all items that were deficient during the inspection. Also provide recommendation of further remedial action.)			oring and inspecti	en or repair		
focuss all items that were deficient during the inspection. Also provide recommendation of further resected action.}			oring and inspecti	en or repair		
Necuss all items that were deficient during the inspection. Also provide recommendation of further recording action.)		stion schedulg.				
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  9 SOO attached Corrective Action Plan (Appendix A) on deficiencies, plansed corrective mean		stion schedulg.			120	-
Necuss all items that were deficient during the inspection. Also provide recommendation of further recording action.)		stion schedulg.			13010	S
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  1 soo attached Corrective Action Plan (Appendix A) on deficiencies, planted corrective mean second action Plan (Appendix A) on deficiencies, planted corrective mean second action Plan (Appendix A) on deficiencies, planted corrective mean second action Planted Plan	euros and essunated corrective n	etion schodusc.  According	an of Insposed / D	que de la companya de	/30 fc	5
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  soo attached Corrective Action Plan (Appendix A) on deficiencies, planted corrective mean series and series of the series of the series of the series of the series of the series of the series of the series of the series and implements treby certify that a complete and through impaction and evaluation of the site and implements.	le mentard remedy has been no	Ha Signals	e of inspoor / D	que de la companya de	30/0	25
Scott W Harding, P.E.  Prented Name of hispoctor	le mentard remedy has been no	Ha Signals	e of inspoor / D	que de la companya de	/30 fc	5
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  19 900 estached Corrective Action Plan (Appendix A) on deficiencies, plansed corrective mean second action of the size and implementation second action of the size and implementation second account of the size and implementation second account of the size and implementation of the siz	lemented remedy has been pend the remedial action objects	A Signals  Formed, and that the was established for the	e of inspoor / D	que de la companya de	30/0	5
Nocuss all items that were deficient during the inaposition. Also provide recommendation of further resected action.)  If further resected action Plan (Appendix A) on deficiencies, plansed corrective mean second action Plan (Appendix A) on deficiencies, plansed corrective mean second action Plan (Appendix A) on deficiencies, plansed corrective mean second action Plan (Appendix A) on deficiencies, plansed corrective mean second visit in the first plansed corrective means are presented that the plansed correction and evaluation of the site and implemented remarks action form have been assessed with respect to the intent of the implemented remarks action form have been assessed with respect to the intent of the implemented remarks action form have been assessed with respect to the intent of the implemented remarks as	lemented remedy has been pend the remedial action objects	A Signals  Formed, and that the was established for the	e of inspoor / D	que de la companya de	30/0	5
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  19 900 estached Corrective Action Plan (Appendix A) on deficiencies, plansed corrective mean second action of the size and implementation second action of the size and implementation second account of the size and implementation second account of the size and implementation of the siz	lemented remedy has been pend the remedial action objects	A Signals  Formed, and that the was established for the	e of inspoor / D	1 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	30/0	5
Necuss all items that were deficient during the inspection. Also provide recommendation of further resected action.)  19 900 stitucing PE.  Printed Name of hispector  Printed Name of O&M Engiacer  Printed Name of O&M Engiacer  Printed Name of O&M Engiacer  Printed Name of O&M Engiacer  Printed Name of O&M Engiacer  Digitally signed by Plobert J. Tees	lemented remedy has been pend the remedial action objects	A Signals  Formed, and that the was established for the	an of Insport I D	1 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	30/0	25
Nocuss all items that were deficient during the inspection. Also provide recommendation of further resected section.)  1 soo attached Corrective Action Plan (Appendix A) on deficiencies, planted corrective mean section and section of the section planted corrective mean section for the section of the site and implemental remarks carried from have been assessed with respect to the intent of the implemental remarks action form have been assessed with respect to the intent of the implemental remarks as	le mentard remedy has been no	A Signals  Formed, and that the was established for the	an of Insport I D	1 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	30/0	25

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 12 of 12

Provide additional notes or sketch as needed:			
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		•	

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 1 of 12

SITE NAME: Site 8 - Goss Cove Landfill (OUS	5)				
EPA ID: CTD980906515	,				
SITE LOCATION: New London County, CT EPA REGION: Region 1					
REMEDY AT SITE: Landfill Cover, Institutio	nal Control	, Monitorin	ıg		
Date: October 11, 2005	Courtne	y D. Moore	.Jr., P.E./ N	lobis Engine	ering Inc
INSPECTOR/COMPANY					
WEATHER CONDITIONS:		Temperatur Weathe		57°F Rainy	<del>_</del>
		Othe		NA	
		Annual I	Inspection	4.	
TYPE OF INSPECTION:	Ξ.	Post-Ma	jor Weather	Event Inspec	ction
		Re-Inspe Other	ection of Def	icient Items	
					<del>-</del>
			T		
	-	j	TON		
	1		NCE	NG.	
AREA OF INSPECTION	1	≱	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
	a	DOES NOT APPLY	MAIN	HAIN	
	INSPECTED	ON S	NIRS/	LIRS/A	
	N N	<u> </u>	REP	REC.	
NSTITUTIONAL CONTROLS					
) Security Fencing, Gates and Signs					
a) Fence at West Limit (P&W RR)	-				None.
b) Fence at Northern Limit			-		None.
c) Fence at Northeast Limit at Bedrock Outcrop					
d) Fence at East Limit Near Main Entrance					Pole in bedrock is bent but functioning, leaves are collecting at the base of the fence.  None.
e) Fence at South Limit at Sewage Pump Station			-	0	None.
f) Fence at South Gas Vents at Nautilus Access Pier					Nose.
g) Fence at Gas Vents at East Limits			-		
h) Locked Entrance or Secure Access	-				Tree branch growing into fence near picnic area.  None.
i) Man Gate Near Lt. Pole #12					Ties are broken
j) Man Gate Near Lt. Pole #G					
k) No Trespassing and Security Signs					None.
l) Indications of Vandalism or Trespassing					Only one sign on rocks with "No trespassing".  None.
N/S/ABIN					NODE.
ANDSCAPING FEATURES					The state of the s
Concrete Pavers					
a) General Condition of Pavers	=		-		None.
b) Level or Designed Slope within Paver Surface	•		-		None.
c) Standing Water - other than above (a)			-		None.
Concrete Curbing (Traffic Areas)					
) General Conditions of Curbing	-		-		None.
) Indication of Cracked Curbing	-		-		
) Indication of Dislodged Curbing	-	0	-	<del></del> f	lone.
) Indication of Heaved Curbing	-				lone.
					lone.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 2 of 12

AREA OF INSPECTION	INSPECTED	BOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
4) Granite Curbing (Exhibit and Paver Areas)					
a) General Conditions of Curbing					Ok.
b) Indication of Cracked Curbing				0	None.
c) Indication of Dislodged Curbing	-		-		None.
d) Indication of Heaved Curbing					Nose.
5) Concrete Sidewalks	+-	+			
a) General Conditions of Sidewalks					to the second of
b) Indication of Cracked Sidewalks	1 -			-	None.
c) Indication of Dislodged Sidewalks					None.
d) Indication of Heaved Sidewalks	-			-	None.
					None.
) Submarine Displays (Four Total)					
a) Conditions of Foundation Support	-				Chimatanana
b) Interface at Ground Surface and Foundations					Chipped concrete on sub near culvert 13.  None.
c) Observation of Exposed Cap Components					None.
Trailer Foundation (Maintenance Bldg)					
a) Conditions of Foundation Support	]_	l _	_		
b) Interface at Ground Surface and Foundations	+=-				None.
c) Observation of Exposed Cap Components	1=				Good. None:
					NOBE.
Missile Hatch Display					
a) Conditions of Foundation Support					None.
b) Interface at Ground Surface and Foundations c) Observation of Exposed Cap Components			-		Good.
ey Concervation by Exposed Cup Components	+=-		-		None.
Gun Display					
a) Conditions of Foundation Support				- 1	
) Interface at Ground Surface and Foundations			0	-	Not observed, possibly removed, currently presents a trip hazard
c) Observation of Exposed Cap Components			.0		
i) Center Island Flagpoles (Poles A, B, and C)	-			-	
e) Retaining Wall on West Side		0	0		
Retaining Well on East Side					
Conditions of Foundation Support					
) Interface at Ground Surface and Foundations					None.
Observation of Exposed Cap Components		<del>-</del>	-	<u></u>	None.
Components	-				None.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 3 of 12

		т—	T		
AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	RPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
11) Flagpole *A					
a) General Condition of Flagpole	-		-	0	
b) Conditions of Foundation Support	-		-	0	None.
c) Interface at Ground Surface and Foundations	-		-		None.
d) Observation of Exposed Cap Components	-				None.
12) Flagpole *B					None.
			l _		
a) General Condition of Flagpole					None.
b) Conditions of Foundation Support	<del>                                     </del>		-		None.
c) Interface at Ground Surface and Foundations			-		Broken outlet at base.
d) Observation of Exposed Cap Components	<del>-</del>				None.
13) Flagpole *C	<del>                                     </del>				
a) General Condition of Flagpole					
b) Conditions of Foundation Support	<b>├</b>				None.
c) Interface at Ground Surface and Foundations			-		None.
d) Observation of Exposed Cap Components			-		None.
					pwik.
14) Flagpole *D	1				
a) General Condition of Flagpole	-		-		Ok, but bent near base.
b) Conditions of Foundation Support					None.
c) Interface at Ground Surface and Foundations	<del>                                     </del>		-		None.
d) Observation of Exposed Cap Components					None.
5) Flagpole *E	-+				
	•		_		
a) General Condition of Flagpole b) Conditions of Foundation Support		-		-	None.
c) Interface at Ground Surface and Foundations			-		Covered in grass.
d) Observation of Exposed Cap Components					Ok.
					None.
h) Flagpole *F					
a) General Condition of Flagpole	-	- I	-		Bent near base.
b) Conditions of Foundation Support			-		None.
c) Interface at Ground Surface and Foundations			-		None.
d) Observation of Exposed Cap Components	•				None.
Pionis Aug					
) Picuic Area	_	_	_		
a) Conditions of Foundation Support			<u>-</u>		lone.
b) Interface at Ground Surface and Foundations		무나	-		one.
c) Observation of Exposed Cap Components	<del>-</del> +		-	-	one.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 4 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
18) Dumpster Pad	-[				
a) Conditions of Foundation Support	=				
b) Interface at Ground Surface and Foundations			-		None.
c) Observation of Exposed Cap Components	-				None.
	<u> </u>				
19) Light Pole #2	1_			1	
a) Conditions of Foundation Support	-				None.
b) Interface at Ground Surface and Foundations		<u> </u>	<b>-</b>		None.
c) Observation of Exposed Cap Components	+		-		None.
(0) Light Pole #6	<del>                                     </del>	<del>                                     </del>			
a) Conditions of Foundation Support					
b) Interface at Ground Surface and Foundations					None.
c) Observation of Exposed Cap Components					None.
					None.
1) Light Pole #7					
a) Conditions of Foundation Support	-				None.
b) Interface at Ground Surface and Foundations			0		None.
c) Observation of Exposed Cap Components	-		D.		None.
!) Light Pole #8					
a) Conditions of Foundation Support					None.
b) Interface at Ground Surface and Foundations					None.
c) Observation of Exposed Cap Components					None.
) Light Pole #9					
a) Conditions of Foundation Support					
b) Interface at Ground Surface and Foundations		<del>  </del>	-		None.
c) Observation of Exposed Cap Components				<u> </u>	None.
,					None.
Light Pole #10					
n) Conditions of Foundation Support					
) Interface at Ground Surface and Foundations	-		-		None.
) Observation of Exposed Cap Components	-	0	-		tone.
Light Pole #11		T			
) Conditions of Foundation Support	-		-		ione.
) Interface at Ground Surface and Foundations		므	-		ope.
Observation of Exposed Cap Components	-				

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 5 of 12

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AREA OF INSPECTION	INSPECTED	BOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	BPAIRSMAINTENANCE BECOMMENDED	NOTES AND COMMENTS
26) Light Pole #12					
a) Conditions of Foundation Support			l =		
b) Interface at Ground Surface and Foundations				<del>                                     </del>	None.
c). Observation of Exposed Cap Components			-		None.
27) Light Pole #14					
a) Conditions of Foundation Support	-		-		None.
b) Interface at Ground Surface and Foundations	-		-		None.
c) Observation of Exposed Cap Components	<b>↓</b> =_		┞		None.
28) Light Pole #G	<del> </del>	ļ			
			_	_	
a) Conditions of Foundation Support	-				None.
b) Interface at Ground Surface and Foundations	+=-				None.
c) Observation of Exposed Cap Components	<del>  -</del>	-	-		None.
29) Light Pole #H					
a) Conditions of Foundation Support					
b) Interface at Ground Surface and Foundations	-				None.
c) Observation of Exposed Cap Components	-		=		None.
					14/330.
30) Light Pole #I					
a) Conditions of Foundation Support	-		-		None.
b) Interface at Ground Surface and Foundations			-		None.
c) Observation of Exposed Cap Components	-				None.
1) Light Pole #K					
	_ 1				
a) Conditions of Foundation Support			-		None.
b) Interface at Ground Surface and Foundations					None.
c) Observation of Exposed Cap Components			-	,	None.
2) Light Pole #S		-+	<del></del>		
a) Conditions of Foundation Support		-			
b) Interface at Ground Surface and Foundations				n	None.
c) Observation of Exposed Cap Components	-	-	-	<del></del>	lone.
		$\neg \neg$			lone.
) Irrigation System				$\neg \dagger$	
a) Conditions of Sprinkler Heads	•			<b>.</b>	lany broken sprinkler heads.
b) System Operation				_	oses are exposed, some separated, whole system is in need of repair.
c) Condition of Pump and Controls	•			i	one.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 6 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
34) Asphalt Surface Cap	1				
a) General Condition of Asphalt Pavement			-		Comment our little in
b) Level or Designed Slope Within Pavement	•	0	-		General condition is good. Ok.
c) Cracks in Pavement			-		None.
d) Erosion in Pavement or Adjacent Areas	-			0	None.
e) Holes/Penetrations in Asphalt Surface			-	0	None.
f) Bulges in Asphalt Surface					None.
g) Standing Water - other than above (b)			-		Some water around catch basin below.
h) Stability of Slopes and Adjacent Areas			-		Ok.
i) Groundwater Monitoring Well Penetration			-		Some ponding noted above some wells (see below).
j) Damage to Pavement Caused by Use			-		None.
k) Exposed Cap Components			-		None.
35) Grass Surface Cap		l			
a) General Condition of Vegetation			-		Good.
b) Level or Designed Slope Within Grass Area			•		None.
c) Erosion in Vegetation or Adjacent Areas					None.
d) Standing Water - other than above (b)	<b>-</b> -				None.
e) Stability of Slopes and Adjacent Areas	-				None.
f) Groundwater Monitoring Well Penetration	-				No settlement around wells in grass.
g) Damage to Pavement Caused by Museum Use	-		-		None.
h) Exposed Cap Components	-		-		None.
SFORM WATER FLATURES					
36) Bex Culvert (Road to River)			- 1		
a) Condition of Upper Junction Box - Exterior					None.
b) Condition of Upper Junction Box - Inserior			-		None.
c) Condition of Box Culvert - Interior Sections					None.
d) Condition of Outfall	-		-		Low volume of water noted, approximately 1 inch of water.
37) Catch Basin 1 (CB 1)					
	_	_	_ 1		
a) General Condition of Inlet					Some leaf litter covering grate, approximately 10% covered.
b) Sediment Within Inlet					None.
c) Obstructions at Pipe Inlets or Outlets			-		None.
38) Catch Basin 2 (CB 2)	$-\!\!-\!\!\!+$	$\dashv$	<del></del>		
a) General Condition of Inlet		· _	_ !	_	
b) Sediment Within Inlet					ome grass covering grate.
c) Obstructions at Pipe Inlets or Outlets					ione.
G Cossi uctions at Fipe inters or Outlets	<del>-</del> +				ione.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 7 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
39) Catch Basin 3 (CB 3)					
a) General Condition of Inlet					
b) Sediment Within Inlet	-	-			Generally in good condition.  None.
c) Obstructions at Pipe Inlets or Outlets			-		None.
40) Catch Basin 4 (CB 4)	ľ				
a) General Condition of Inlet				- 🗅	Generally in good condition.
b) Sediment Within Inlet					Approximately 7 to 8 inches in bottom.
c) Obstructions at Pipe Inlets or Outlets	_   _				None.
41) Cotab Paris 5 (CD C)		<b>_</b>	<b></b>		
41) Catch Basin 5 (CB 5)		ł			
a) General Condition of Inlet			-		Generally in good condition.
b) Sediment Within Inlet					Approximately 6 inches in bottom.
c) Obstructions at Pipe Inlets or Outlets			-		None.
12) Catch Basin 7A (CB 7A)					
•	1_		l _ l		
a) General Condition of Inlet					Generally in good condition.
b) Sediment Within Inlet					None.
c) Obstructions at Pipe Inlets or Outlets					None.
3) Catch Basin 7B (CB 7B)		<u> </u>	$\vdash$		
		_ :	l _ I		
a) General Condition of Inles b) Sediment Within Inles	+=				Generally in good condition. Some leaves collecting in grate.
				]	None.
c) Obstructions at Pipe Inlets or Outlets					None.
f) Catch Basin 8 (CB 8)					
a) General Condition of Inlet		_		`	
b) Sediment Within Inlet					Puddles around concrete in asphalt.
c) Obstructions at Pipe Inlets or Outlets		<del>-</del>			None.
ty oosti actions at 1 the titles or Outlets	-				None.
Catch Basin 9 (CB 9)			<del>-  </del>		
a) General Condition of Inlet		_		_	
b) Sediment Within Inlet			-		Brown water in basin.
c) Obstructions at Pipe Inlets or Outlets					None,
s, soon actions at 1 spe miets or Crutiets	+		<del>-</del> +		None.
Yard Drain 6A (YD #6A)	<del>                                     </del>	<del>-  </del>			
a) General Condition of Inlet	I ■ I	_		_	
b) Sediment Within Inlet	1 -				Generally in good condition.
c) Obstructions at Pipe Inlets or Outlets			$\exists$ $+$		Not measured, too deep for measuring stick.
	– .	_			lone.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 8 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
47) Yard Drain 6B (YD #6B)					
a) General Condition of Inlet	-				50% covered by loc line. Land
b) Sediment Within Inlet			-		50% covered by leaf litter. Landscape material exposed near grate.  Not measured, too deep for measuring stick.
c) Obstructions at Pipe Inlets or Outlets			-		None.
48) Yard Drain 7C (YD #7C)	-	<u> </u>			
	<b> </b> _ '	l _	1	l	
a) General Condition of Inlet	┞╬╌	<del>├                                    </del>	<b>                                     </b>		Vegetative growth noted around entrance.
b) Sediment Within Inlet	┼┋╴				None.
c) Obstructions at Pipe Inlets or Outlets	-		-		None.
49) Yard Drain 71 (YD #11)		<u> </u>			
			1_1	_	
a) General Condition of Inlet b) Sediment Within Inlet	-		-		Generally in good condition. Water flowing clear and unobstructed.
					None.
c) Obstructions at Pipe Inlets or Outlets					None.
50) Yard Drain 11A (YD #11A)					
a) General Condition of Inlet			_	_	
b) Sediment Within Inlet					Trash, cigarette and leaves over grate.
c) Obstructions at Pipe Inlets or Outlets					Approximately 2 inches at bottom.
y searce on all ripe inters or Outers					None.
51) Yard Drain 13 (YD #13)					
a) General Condition of Inlet				_	
b) Sediment Within Inlet					Partially covered by dirt and grass.
c) Obstructions at Pipe Inlets or Outlets					Less than 1/2 inch.
					None.
STORM WATER PRATURES					
52) Gas Vent *L					
a) Condition of Riser and Top Section			-	_ [	Committee
b) Condition of Screen			0		Generally in good condition.
					No screen noted. Need a lock for the gate surrounding the vent.
3) Gas Vent *M					
a) Condition of Riser and Top Section	-	_□			Generally in good condition.
b) Condition of Screen			0		cenerally in good condition. Need a lock for the gate surrounding the vent. Vegetation buildup around
					tate entrance should be removed.
4) Gas Vent *N		T			
a) Condition of Riser and Top Section			<b>.</b>		ienerally in good condition.
b) Condition of Screen					
				N	o screen noted, needs to be installed.

# INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 9 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRSMAINTENANCE NOT RECOMMENDED	REPAIRSMAINTENANCE RECOMMENDED	NOTES AND COMMENTS
55) 8MW)			T		
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	-				Some sediment and ponding of water on concrete
c) Condition of Well Lock	-		-		Missing a bolt on the cover.  No lock noted.
56) 8MW2S					- O DOE NOTE.
50) 8M W 25					
a) Condition of Surface Surrounding Well Cover	-				Concrete and road box are in good condition, recently replaced.
b) Condition of Flush Mount Well Cover					None.
c) Condition of Well Lock	-		_		No lock noted.
57) 8MW2D					
o) Continue to the same	l _	_	_	l _	
a) Condition of Surface Surrounding Well Cover b) Condition of Flush Mount Well Cover					Concrete and road box are in good condition, recently replaced.
c) Condition of Well Lock					None.
Common by Wen Lock	<del>   </del>		-		No lock noted.
8) 8MW3					
a) Condition of Surface Surrounding Well Cover			-		
b) Condition of Flush Mount Well Cover	-				Rim of well not flush with concrete, water is pooling around concrete.
c) Condition of Well Lock	-				Cover is loose, bolts need tightening.
					No lock noted.
9) 8MW4					
a) Condition of Surface Surrounding Well Cover	-		-		Concrete is in acceptable condition.
b) Condition of Flush Mount Well Cover	-				Cover needs two bolts.
c) Condition of Well Lock			-		No lock noted, no dedicated pump, water inside over well cap has sheen on it.
) 8MW5S					
	_	_			
a) Condition of Surface Surrounding Well Cover					Concrete is in acceptable condition.
b) Condition of Flush Mount Well Cover		무	<del></del>	-	Cover is missing a bolt, and road box is missing the bolt thread. Ponding water over concrete.
c) Condition of Well Lock					No lock noted.
8MW6S	-	+			
a) Condition of Surface Surrounding Well Cover					
condition of Flush Mount Well Cover		<del>-                                    </del>	╗┼		ome under mining of concrete pad at stone blocks.
Condition of Well Lock	-	-	-	<del></del>	None.
			-+		lo well lock noted.
8MW6D		一十			
8MW6D ) Condition of Surface Surrounding Well Cover		0	-		oncrete and road box are in good condition, recently und
	-	0		$\neg$	oncrete and road box are in good condition, recently replaced.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 10 of 12

AREA OF INSPECTION	INSPECTED	DOES NOT APPLY	REPAIRS/MAINTENANCE, NOT RECOMMENDED	REPAIRS/MAINTENANCE RECOMMENDED	NOTES AND COMMENTS
63) 8MW7S					
a) Condition of Surface Surrounding Well Cover			-		
b) Condition of Flush Mount Well Cover	-	<del>                                     </del>		<del>                                     </del>	Concrete is in acceptable condition.
c) Condition of Well Lock		0			None.
			1		No lock noted, rubber cap over tubing.
54) 8MW8S				<b></b>	
a) Condition of Protective Casing	-				
b) Condition of Well Cover					Concrete is in acceptable condition ponding water noted on top, well reportedly not guaged or sampled.
c) Condition of Well Lock		<del>                                     </del>			None.
d) Condition of Well Protection - Bollards					None.
					None installed.
5) 8MW8D		<del>                                     </del>			
a) Condition of Protective Casing					
b) Condition of Well Cover		-			None.
c) Condition of Well Lock		1 =			None.
d) Condition of Well Protection - Bollards		1 =			No lock noted.
		╁╼	<del>                                     </del>		None installed.
6) 8MW9S		<del> </del>			
a) Condition of Surface Surrounding Well Cover			_	_	
b) Condition of Flush Mount Well Cover					Under puddle in roadway, reportedly not sampled.
c) Condition of Well Lock					None.
	+=-				No lock noted.
8MW10S			-		
a) Condition of Surface Surrounding Well Cover					
b) Condition of Flush Mount Well Cover	1 -				Well not inspected, unable to locate, possibly buried under loam and grass.
c) Condition of Well Lock				<del>-</del> -	
, Seminor of Tell LOCK		-			
HNUS-23 (Tank Farm)					
t) Condition of Surface Surrounding Well Cover		_	_	_ 1	
Condition of Flush Mount Well Cover	+=-				lo concrete around cover.
Condition of Frush Mount Well Cover  Condition of Well Lock	+=				fissing one bolt, the other bolt is coming up.
Common of Well Lock					io lock noted.

#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 11 of 12

Adequacy of O&M at Site:	
Overall, O&M practices at the site are sufficient. Current practices shot	uld be stufficient to maintain the effectiveness of the company
	and Circultures of the Femery,
Notes:	
Notes as listed above in checklist.	
oncrete circular pad located near Missile Halch Display, Ro Igalion system has many exposed pipes that are dameged	epresents a trip hazard. and/or separated. Broken section and several sprinkler heads are not functional and in need
oncrete circular pad located near Missile Halch Display. Ri rigation system has many exposed pipes that are dameged repairfreplacement. ome sediment build up in CB-4 and CB-5. Leaf litter and gr	and/or separated. Broken section and several sprinkler heads are not functional and in need
concrete circular pad located near Missile Halch Display. Ri rigation system has many exposed pipes that are dameged f repairfreplacement. ome sediment build up in CB-4 and CB-5. Leaf litter and gr WW10S is buried under loam.	and/or separated. Broken section and several sprinkler heads are not functional and in need
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#### INSPECTION CHECKLIST SITE 8 - GOSS COVE LANDFILL Page 12 of 12

Provide additional notes or sketch as needed:	
Soo alberhald starts	
See attached sketch	
	· · · · · · · · · · · · · · · · · · ·
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### APPENDIX B

FIVE-YEAR REVIEW SITE PHOTOGRAPHS



SITE 2 – AREA A LANDFILL AND WETLAND
DETERIORATED CONDITION OF MONITORING WELL 2LMW20D
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
SEDIMENT AND DEBRIS COVERING THRESHER AVENUE CATCH BASIN
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
SIGN AT THRESHER AVENUE ENTRANCE OF AREA A LANDFILL
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND INLET OF CULVERT 2 FACING NORTHEAST APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
COLD PATCHED DEPRESSION ALONG INLET HEADWALL OF CULVERT 2
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND OUTLET OF CULVERT 2 FACING SOUTHWEST APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND DEBRIS CLOGGING CHANNEL C APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND GAS VENT 18 – REQUIRES THIRD BARRIER FOR COMPLETE PROTECTION AND SCREEN ON VENT APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
OUTLET OF CULVERT 1 FACING SOUTHWEST; MINOR EROSION OF CHANNEL A
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
BARRIERS AND EQUIPMENT COVERING MONITORING WELLS NEAR CULVERT 1
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
DEBRIS AND VEGETATION IN CHANNEL A NEAR GAS VENT 7
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND DEBRIS AND VEGETATION IN CHANNEL A NEAR GAS VENT 2 APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



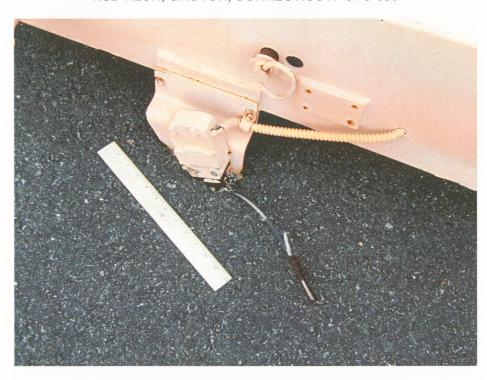
SITE 2 – AREA A LANDFILL AND WETLAND
AREA A WETLAND FROM NEAR 2LMW9D FACING NORTHEAST
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
TREATED TIMBERS COVERING MONITORING WELLS 2LOW1S AND
OTHERS IN NORTHWESTERN PART OF CAP
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



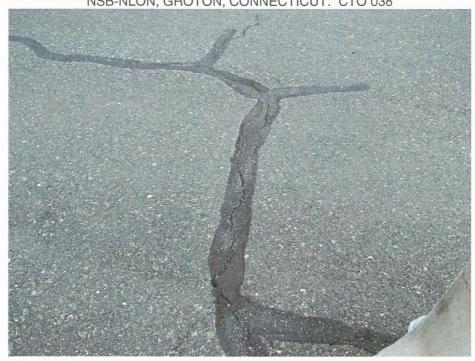
SITE 2 – AREA A LANDFILL AND WETLAND
IMPROPERLY DUMPED CONCRETE RUBBLE ON CAP IN
NORTH-WESTERN PART OF CAP
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
GOUGE FROM IMPROPER STORAGE OF EQUIPMENT IN NORTH-CENTRAL PART OF CAP
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND DETERIORATED CONDITION OF 2LMW8S APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND SEALED CRACKS IN CAP PAVEMENT APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND CRACKS IN DEPLOYED PARKING AREA PAVEMENT APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND TREE GROWING IN GAS VENT-27 APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND VEGETATION IN CRACK AT DEPLOYED PARKING AREA APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
DEBRIS AGAINST FENCE AND FENCE DETACHED AT BOTTOM
IN DEPLOYED PARKING AREA
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND MONITORING WELL 2WMW46DS APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 2 – AREA A LANDFILL AND WETLAND
TREE STUMP REMAINING IN RIPRAP ALONG TOE OF CAP
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA OBDA POND AND UPPER POND FACING NORTHWEST APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 3 – AREA A DOWNSTREAM WATERCOURSES/OBDA STREAM 4 AND UPPER POND FACING NORTHWEST APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 6 – DRMO
DEBRIS AND PONDED WATER ON SOUTHWEST CORNER OF CAPPED AREA
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 6 – DRMO
NEW CONCRETE PAD FOR MONITORING WELL 6MW11D
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 6 – DRMO
DROP INLET WITH GRATE AT NORTHERN END OF CAPPED AREA
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 6 – DRMO
PERIMETER CHANNEL ALONG EASTERN SIDE OF CAPPED AREA
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 6 – DRMO
CAPPED AREA AND BUILDING 491 FACING SOUTH
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 7 – TORPEDO SHOPS CONTAMINATED SOIL STOCKPILES ALONG WEST SIDE OF BUILDING 325 APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 7 – TORPEDO SHOPS
EXCAVATION ALONG WESTERN SIDE OF BUILDING 325 AND
CONTAMINATED SOIL STOCKPILES FACING NORTH
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 7 – TORPEDO SHOPS
EXCAVATION ALONG SOUTHERN SIDE OF BUILDING 325 FACING EAST
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
GAS VENT L – NO LOCK ON GATE OR SCREEN ON VENT
LOOKING NORTHWEST
APRIL 3, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
GAS VENT M WITH VEGETATION ON GATE
LOOKING NORTH
APRIL 3, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
NEW CONCRETE PAD AT MONITORING WELL 8MW2D
LOOKING WEST
APRIL 3, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL BRUSH AGAINST FENCE NEAR GAS VENT L LOOKING SOUTHEAST APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL LOOKING NORTH AT FENCED MAINTENANCE BUILDING HAZARDOUS MATERIALS BEING STORED IN UNLOCKED STORAGE LOCKERS APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
MISSING BOLT IN COVER FOR MONITORING WELL 8MW5S
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL LOOKING SOUTH AT CAP AND MUSEUM APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



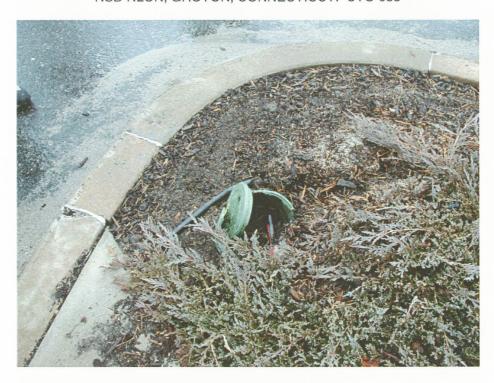
SITE 8 – GOSS COVE LANDFILL VEGETATIVE DEBRIS ON YARD DRAIN #13 APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
MISSILE HATCH DISPLAY AND FOUNDATION FOR FORMER GUN DISPLAY
LOOKING EAST
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL LOOKING NORTH AT MONITORING WELL 8MW9S IN CENTER PUDDLE AND APPROXIMATE LOCATION OF MONITORING WELL 8MW10S IN CURBED AREA APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITE 8 – GOSS COVE LANDFILL
BROKEN SPRINKLER JUNCTION BOX NEAR LIGHT POLE K
LOOKING NORTHWEST
APRIL 4, 2006
NSB-NLON, GROTON, CONNECTICUT. CTO 038



SITES 9/23 – OT-5 AND TANK FARM LOOKING NORTHEAST AT LOCATION OF SITE 9 (OT-5) APRIL 4, 2006 NSB-NLON, GROTON, CONNECTICUT. CTO 038

#### **APPENDIX C**

- C.1 AREA A LANDFILL
- C.2 DRMO
- C.3 GOSS COVE LANDFILL

C.1 AREA A LANDFILL

I. SITE IN	FORMATION	
Site name: Site 2 Area A Landfill	Date of inspection: 4/4/06	
Location and Region: New London Co., CT	EPA ID: CTD980906515	
Cocation and Region: New London Co., CT   EPA ID: CTD980906515		
Remedy Includes: (Check all that apply)		
Site name: Site 2 Area A Landfill  Location and Region: New London Co., CT  Agency, office, or company leading the five-year review: EFANE/EPA Region 1  Remedy Includes: (Check all that apply)    Landfill cover/containment   Monitored natural attenuation     Access controls   Groundwater containment     Institutional controls   Vertical barrier walls     Groundwater pump and treatment     Other   Monitoring program to determine final remedy for groundwater operable unit. Landfill gas vents and perimeter channels.  Attachments:   Inspection team roster attached   Site map attached    I. INTERVIEWS (Check all that apply)  1. O&M site manager   Richard Conant   REC/IR Program Manager   4/3/06     Name   Title   Date    Date		
☑ Access controls	Groundwater containment	
☑ Institutional controls	Vertical barrier walls	
☐ Groundwater pump and treatment		
☐ Surface water collection and treatment		
☐ Other <u>Monitoring program to determine</u>	final remedy for groundwater operable unit. Landfill	
gas vents and perimeter channels.		
Attachments:  Inspection team roster attached	Site map attached	
H. INTERVIEWS	(Check all that apply)	
1. O&M site manager Richard Conant	REC/IR Program Manager 4/3/06	
Name	Title Date	
Interviewed  at site  at office  by phone F	Phone no. <u>(860)694-5649</u>	
	have broken concrete, furniture, creosote timers, and	
other miscellaneous debris removed later this month.		
2.0035 / F D.1 T 7000/500000 0050 N.1 T		
Name	Title Date	
Interviewed  at site  at office  by phone Pl	hone no	
Problems, suggestions; Report attached		
	V	

Contact K. Keckler			
	RPM	4/4/06	(617)918-1385
Name	Title	Date	Phone no.
roblems; suggestions;  Report at	tached No comments d	uring inspection.	
agency CTDEP			
Contact Mark Lewis	RPM	4/4/06	(860)424-3768
Name	Title	Date	Phone no.
roblems; suggestions;  Report at	tached No comments d	uring inspection.	
•			
Agency			
Contact			
Name	Title	Date	Phone no.
roblems; suggestions;  Report at	tached		
	· · · · · · · · · · · · · · · · · · ·	1 ··	
Agency			
Contact			
Name	Title	Date	Phone no.
roblems; suggestions;  Report at	tached		
. Other interviews (optional)	enort attached		
` •		m minmon cooling	amala in navament and fi
R. Tess, ECC - ECC has been trim depression over culvert with cold p			
nd remove tree in gas vent; howe	ver, the Navy and ECC	will coordinate a	ccess to the Deployed Parl
Area to conduct maintenance.			

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)	
1. O&M Documents  O&M manual	
2. Site-Specific Health and Safety Plan ☐ Readily available ☐ Up to date ☐ N/A ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A ☐ Remarks ☐ Readily available ☐ Up to date ☐ N/A	
3. O&M and OSHA Training Records	
4. Permits and Service Agreements  Air discharge permit	
5. Gas Generation Records	<u> </u>
6. Settlement Monument Records	
7. Groundwater Monitoring Records   Remarks Monitoring now performed semi-annually. Round 16 GMR was issued January 2006 ff sampling in May through June. Round 16 report final in February 2006. The next round of sampling was due in December 2005.	<u>for</u>
8. Leachate Extraction Records	
9. Discharge Compliance Records  Air Readily available Up to date N/A  Water (effluent) Readily available Up to date N/A  Remarks	— —
10. Daily Access/Security Logs ☐Readily available ☐Up to date ☐N/A  Remarks	

			IV. O&M CC	STS	
       	O&M Organizatio  ☐ State in-house  ☐ Federal Facility  ☐ Other TtNUS process  ☐ 3 years of gromaintenance.	☐ Control in-house repared groundwar	ractor for State ter monitoring plaing. ECC perfor	☐ PRP in-house ☐ Contractor for Federan and O&M manual formed recent groundwater	r Navy and performed
2. <b>C</b>	O&M Cost Record ☐ Readily availal Original O&M co	ble	100	☐ Funding mechanism☐ Breakdown attache	_
3. U	from \$133,000 to data validation, and	d reasons: Monito \$245,000 per year d reporting.	oring costs for Y r in addition to C	Breakdown attact Breakdown attact Breakdown attact Breakdown attact Breakdown attact Breakdown attact Breakdown attact Cap Review Period Breakdown Attact Cap Review Period Breakdown Attact Ca	ched ched ched ched ched ched ched ched
44	V. ACCESS ANI	D INSTITUTION	AL CONTROL	S Applicable	e 🔲 N/A
A. Fenc			IL CONTROL	Б Аррисаон	U IVA
. ]	Fencing damaged Remarks Fence in bottom in Deploye	good condition b	on shown on site out gate is not lo		red N/A Fence detached at
B. Other	r Access Restriction	ons		and the second s	
!	not dig, and crane	Thresher Avenue operators must u authority includin	entrance state " se support pads. g name and teler	tion shown on site map Restricted Area Officia Signs at all 3 gates. Shone number for persont.	l Business Only", do Recommend posting

C. Ins	stitutional Controls (ICs)	
1.		No N/A N/A N/A
	Type of monitoring (e.g., self-reporting, drive by) Drive by  Frequency Quarterly	
	Responsible party/agency Naval Submarine Base - New London	
	Contact Richard Conant IR Manager	-
	Name Title	Date Phone no.
	Reporting is up to date Reports are verified by the lead agency	<ul><li>✓ Yes ☐ No ☐ N/A</li><li>☐ Yes ☒ No ☐ N/A</li></ul>
	Specific requirements in deed or decision documents have been met Violations have been reported	☐ Yes ☒ No ☐ N/A ☐ Yes ☒ No ☐ N/A
	Other problems or suggestions: <u>Police patrol driving at site stopped inspection team and asked team asked nature of business.</u>	
	Per IC Document SOPA (Admin) New London Instruction 50 contractors shall contact the Public Works Engineering division prior beauty againment on Site 2. The IR R. P. M. (1997)	or to operation or storage of
	heavy equipment on Site 2. The IR Program Manager will pro	vide guidance for projects
	proposing ground surface disruption, subsurface excavation, or dewated document are not being followed.	ering work. Directions in IC
	document are not being followed.	
2. Ade	quacy ☐ICs are adequate ☐ICs are inade Remarks <u>Uncontrolled dumping on site.</u> Stored items blocking a Asphalt not protected from point loads.	quate  N/A ccess to monitoring wells.
D. Gei	neral neral	
1.	Vandalism/trespassing	☑ No vandalism evident
2.	Land use changes on site N/A Remarks Some uncontrolled dumping of construction debris and furnit	ure.
3.	Land use changes off site N/A Remarks	
	VI. GENERAL SITE CONDITIONS	
A. Roa	ds ⊠ Applicable □ N/A	
1.	Roads damaged ☐ Location shown on site map ☐ Roads Remarks ☐ Location shown on site map	ads adequate N/A

B. Otl	her Site Conditions
	Remarks Equipment storage on cap is unorganized. Proper storage techniques not being used.
!	
	VII. LANDFILL COVER
A. Lai	ndfill Surface
1.	Settlement (Low spots)
	Areal extent Depth
	Remarks Low spot in pavement over Culvert 2 has been repaired with cold patch asphalt. Some wavy pavement.
2.	Cracks
	Lengths Widths Depths
	Remarks Cracks throughout. Many cracks were sealed but reopened. Cracks in Deployed Parking area need to be sealed but gate is locked.
3.	Erosion ☐ Location shown on site map ☐ Erosion not evident
	Areal extent Depth
·	Remarks
4.	Holes
	Areal extent Depth
<u>.</u>	Remarks Two small holes noted, likely due to storage of heavy items without surface protection.  Holes did not fully penetrate asphalt.
5.	Vegetative Cover ☐ Grass ☐ Cover properly established ☐ No signs of stress
	☐ Trees/Shrubs (indicate size and locations on a diagram)
	Remarks No vegetative cover.
6.	Alternative Cover (armored rock, concrete, etc.)
	Remarks <u>Gabions in good condition</u> . Riprap had small trees but they were cut to a few inches high and brush removed.
7.	Bulges
	Areal extent Height
	Remarks <u>Bulges were identified in Deployed Parking Area during O&amp;M inspection in 2005. Aerial extent was not determined during site inspection for Five-Year Review.</u>

8.	Wet Areas/Water Damage	Wet areas/wa	iter damage not	evident		
	☐ Wet areas	☐ Location sho	wn on site map	Areal e	extent	
	☐ Ponding	☐ Location sho	wn on site map	Areal e	extent	
	☐ Seeps	Location sho	wn on site map	Areal e	xtent	
	☐ Soft subgrade	☐ Location sho	wn on site map	Areal e	xtent	
	Remarks			N 1		
9.	Slope Instability	s	n on site map	No evi	dence of slope instability	,
	Areal extent					
	Remarks	·				
		Applicable	⊠ N/A			
<b>C.</b> 1	Letdown Channels	Applicable	⊠ N/A			
D. (	Cover Penetrations	☐ Applicable	□ N/A			
1.	Gas Vents	☐ Active	<b>⊠</b> Passive			
	Not Properly secured/locked	□ Functioning	☐ Routinely	sampled	☐ Good condition	
٠	☐ Evidence of leakage at penet	ration	☐ Needs Mai	ntenance		
	□ N/A					
	Remarks <u>Gas vents need scree</u> 7 ft. high.	ns. Tree growing at	GVR-27 in De	ployed Parl	king Area, estimated	
	7 101 1115111					
2.	<b>Gas Monitoring Probes</b>					
	☐ Properly secured/locked	☐ Functioning	☐ Routinely s	sampled	☐ Good condition	
	☐ Evidence of leakage at penet	ration	☐ Needs Mai	ntenance	N/A	
	Remarks				· · · · · · · · · · · · · · · · · · ·	
					· · · · · · · · · · · · · · · · · · ·	_
3.	Monitoring Wells					
	☑ Properly secured/locked	☐ Functioning	☑ Routinely s	sampled	☐ Good condition	
	☐ Evidence of leakage at penet	ration	Needs Mai	ntenance	□N/A	İ
	Remarks 2LMW20D appears to by creosote timbers - inaccessis 2LMW8S open, damaged, furally 2LMW34DS should be abandance monitoring wells to keep them barriers are used to protect gas well as the same appears to the same appears	ble. Wells at other  ll of leaves and w  loned. Perhaps je  from being covere	locations inacc rater. Wells ? rsey barriers o	essible due 2LMW18S. an be pla	to jersey barriers. 2LMW18D, and ced around active	

4.	Leachate Extraction Wells		·	
,	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	Evidence of leakage at pe	enetration	☐ Needs Maintenance	⊠N/A
	Remarks			
5.	Settlement Monuments	<del></del>	☐ Routinely surveyed	⊠ N/A
	Remarks	***************************************		
E.	Gas Collection and Treatment	☐ Applicable	P N/A	•
F.	Cover Drainage Layer	☐ Applicable	. □ N/A	☑ NO ACCESS
G.	<b>Detention/Sedimentation Ponds</b>	□ A	pplicable N/A	
Н.	Retaining Walls	Applicable	⊠ N/A	The state of the s
I.	Perimeter Ditches/Off-Site Disc	harge 🛛 App	olicable N/A	
1.		Location shown on site	•	ation not evident
	Areal extent	Depth	· · · · · · · · · · · · · · · · · · ·	
	Remarks Channel C has dee			
	free flowing. Soil, leaves, a penetrate asphalt in several			
	Avenue are completely block			
2.	Vegetative Growth	Location shown on site	e map N/A	
		Vegetation does not im	npede flow	•
	Areal extent	Depth		
	Remarks Some phragmites i	n channels		
_			·	
3.		Location shown on site	· •	sion not evident
	Areal extent	<u>-</u>		
	Remarks Asphalt at outlet of	culvert 1 appears to be	deteriorated.	
4.	Discharge Structure	Functioning	⊠ N/A	
	Remarks			
				-
J.	Monitoring Wells (off site)			
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at per	netration	☐ Needs Maintenance	□N/A
	Remarks 2LMW20D appear	s to be partially abando	ned. Need to formally ab	andon well. Wells
	21 3/13/25 21 3/13/195 21 3/1	11/10D ALLMINADO	1 01 1 011/2/1001 1.	
	<u>2LMW8S, 2LMW18S, 2LM</u> be abandoned.	W 18D, 2LM W 20D, and	1 2LMW34DS are also da	imaged and should
	be abandoned.  VIII. VERTICAL 1			maged and should  N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES   Applicable   N/A	
X. OTHER REMEDIES	
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	٠
XI. OVERALL OBSERVATIONS	
A. Implementation of the Remedy	
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).	
The remedy is successfully reducing infiltration of precipitation through the landfill and protects human and ecological receptors from exposure to contaminated soil.	
Placement of jersey barriers around active monitoring wells will prevent storage of materials in the wells, which makes them inaccessible	
D AI COOM	
B. Adequacy of O&M Describe issues and observations related to the implementation and scope of O&M procedures. In particular discuss their relationship to the current and long-term protectiveness of the remedy.	ar,
Limited O&M has been completed at the site since the cap was constructed. Cracks in the payement have been sealed and sediment and vegetation have been removed from the channels, culverts, and rip	
rap; however, these are recurring problems and the frequency of O&M must increase. In addition, some identified deficiencies have not been corrected by the O&M Program. Some monitoring wells require	
repair or abandonment. Institutional controls are not fully implemented, as site access and storage	
control is inadequate and signs do not list contact name and phone number. Gas vents need screens, additional barriers, and one gas vent needs tree removed.	
C. Early Indicators of Potential Remedy Problems	
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high freque of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future	
Sealing asphalt cracks, clearing channels, and cutting vegetation in riprap should continue as cracking, sedimentation, and vegetation are recurring problems. Also, uncontrolled storage of heavy items results in damage to asphalt requiring repair. The asphalt surface should continue to be maintained to allow	
vehicles and equipment to be moved around without damaging any of the underlying cap components.  Phragmites growth in the drainage channels should be managed aggressively since these invasive plants	
have significant root structures that could damage underlying material and their presence in the channels cuases impediments to flow. Overall O&M of the cap system needs to be improved.	

D. Opportunities for Optimization	
Describe possible opportunities for optimization in n	nonitoring tasks or the operation of the remedy.
Based on 5 years of monitoring and statistical evaluation well monitoring should be reduced from semiannually	tion, the contaminants are not migrating; therefore,
Unnecessary or unused wells should be abandoned.	
A final groundwater Record of Decision (ROD) shou	ld be prepared.

#### Inspection Team Roster for Site 2 Area A Landfill

Corey Rich of Tetra Tech NUS, Inc.

Nina Balsamo of Tetra Tech NUS, Inc.

Kymberlee Keckler of USEPA Region I

Mark Lewis of CTDEP

Robert Tess of ECC

Greg Kemp of Gannett Fleming (as a representative of USEPA Region I)

Mark Evans, EFANE

C.2 DRMO

I. SITE IN	FORMATION
Site name: Site 6 DRMO	Date of inspection: 4/4/06
Location and Region: New London County, CT	EPA ID: CTD980906515
Agency, office, or company leading the five-year review: EFANE/EPA Region 1	Weather/temperature: Overcast, windy, 40s
Remedy Includes: (Check all that apply)	
☐ Landfill cover/containment	Monitored natural attenuation
☐ Access controls (sign in)	Groundwater containment
☐ Institutional controls	Vertical barrier walls
☐ Groundwater pump and treatment	
☐ Surface water collection and treatment	
Other Monitoring program to determine	final remedy for groundwater operable unit.
Attachments:   Inspection team roster attached	Site map attached
	(Check all that apply)
1. O&M site manager Richard Conant	REC/IR Program Manager
Name	Title Date
Interviewed ☐ at site ☐ at office ☐ by phone P Problems, suggestions; ☐ Report attached	Phone no. <u>(860)694-5649</u>
2. O&M staff R. Tess, ECC (508)229-2270; Mark Eva	ns, EFANE (610)595-0567 ext 162 4/3/06 - 4/4/06
Name	Title Date
Interviewed  at site  at office  by phone Ph	none no
Problems, suggestions; Report attached	

3. Local regulatory authorities and office, police department, office of por other city and county offices, etc.	ublic health or environs	e., State and Triba mental health, zon	l offices, emergency respons ing office, recorder of deeds	e ,
Agency <u>USEPA Region 1</u>				
Contact K. Keckler	RPM	4/4/06	(617)918-1385	
Name	Title	Date	Phone no.	_
Problems; suggestions;  Report att	ached No comments p	rovided during in	spection.	_
		- An		_
Agency CTDEP				
Contact Mark Lewis	RPM	4/4/06	(860)424-3768	_
Name	Title	Date	Phone no.	
Problems; suggestions;  Report att	ached No comments p	rovided during ins	spection.	_
<del></del>		<u> </u>		_
Agency				
Contact				_
Name	Title	Date	Phone no.	
Problems; suggestions;  Report att	ached			_
		-		_
Agency	<u> </u>			
Contact		·		
Name	Title	Date	Phone no.	_
Problems; suggestions;  Report atta	iched			
				_
4. Other interviews (optional) □Rep	oort attached.			
DRMO representative accompanied to				
	on mappoonon.			-
				-
				-
				-

III. ON-SITE DOCUMENTS &	RECORDS VERIFIED (	Check all that appl	у)
1. O&M Documents			
□ O&M manual       ☒ Readily avail         □ As-built drawings       ☒ Readily avail         □ Maintenance logs       ☒ Readily avail         Remarks       ☒	lable \times Up to	date $\square$ N/A	<b>A</b>
2 Site Smeaks Health and Section			
2. Site-Specific Health and Safety Plan  Contingency plan/emergency response plan Remarks	☐ Readily available ☐ Readily available	Up to date Up to date	⊠ N/A ⊠N/A
3. O&M and OSHA Training Records Remarks	Readily available	☐Up to date	⊠N/A
4. Permits and Service Agreements			
□Air discharge permit       □Readily avail         □Effluent discharge       □Readily avail         □Waste disposal, POTW       □Readily avail         □Other permits       □Readily avail         Remarks       □Readily avail	able Up able Up able Up	to date N/A to date N/A to date N/A to date N/A	
5. Gas Generation Records Remarks	☐Readily available	□Up to date	⊠N/A
6. Settlement Monument Records Remarks	□Readily available	☐Up to date	⊠N/A
7. Groundwater Monitoring Records  Remarks Monitoring is now performed annua sampling on June 2005. The next round of sample	⊠Readily available  lly. Year 7 GMR was  ling is due in June 2006.	☑Up to date issued in January	□N/A 2006 for
8. Leachate Extraction Records Remarks	☐Readily available	☐Up to date	⊠N/A
9. Discharge Compliance Records			
☐ Air ☐ Readily availa ☐ Water (effluent) ☐ Readily availa Remarks	able □Up t		
10. Daily Access/Security Logs  Remarks Visitors must sign in.	⊠Readily available	☑Up to date	□N/A

			IV. O&M CO	OSTS	
1.	☐ State in-house ☐ Federal Facility ☐ Other TtNUS 4 years of grour maintenance.	Conty in-house  prepared groundy	ractor for State  water monitoring ng. ECC perf	☐ PRP in-house ☐ Contractor for PRP ☐ Contractor for Federal Facility  plan and O&M manual for Navy and first forming groundwater monitoring and site	
2.			186 per year [t cap, fencing, an		
•	From 2000 Date	To <u>2001</u> Date	\$0 Total cost	☐ Breakdown attached	
	From 2001 Date	To <u>2002</u> Date	\$0 Total cost	Breakdown attached	
*	From 1/2003  Date From 1/2004  Date	To 12/2003 Date To 12/2004 Date	\$10,700 Total cost \$10,900 Total cost	☐ Breakdown attached ☐ Breakdown attached	
	From <u>1/2005</u> Date  From  Date	To <u>12/2005</u> Date  To  Date	\$10,800 Total cost	☐ Breakdown attached ☐ Breakdown attached	
3.	\$123,000 per year and reporting	l reasons: Long ter in addition to O&	rm monitoring co	g Review Period  sts over the past 5 years have been \$44,000 to cludes sampling and analysis, data validation,  \$84,000 per year for the first 3 years for quarterly	
		DINSTITUTION	AL CONTROL	S Applicable N/A	
A. Fen  1.	Fencing damaged	of fence damaged	on shown on site in Scrap Metal S reviously unfence	storage Area. New fence being constructed	
	er Access Restricti				$\dashv$
1.	Signs and other services Remarks Visitors inspection. Sign p	s must sign in. ]	Inspection team	ion shown on site map N/A was escorted by site personnel throughout	
		**************************************			

C.	nstitutional Controls (ICs)
1.	Implementation and enforcement         Site conditions imply ICs not properly implemented       ☐ Yes ☒ No ☐ N/A         Site conditions imply ICs not being fully enforced       ☐ Yes ☒ No ☐ N/A
	Type of monitoring (e.g., self-reporting, drive by) <u>Visitor sign-in and escort.</u> Frequency <u>Quarterly</u> Responsible party/agency <u>Naval Submarine Base - New London</u>
	Contact Richard Conant IR Manager
	Name Title Date Phone no.
	Reporting is up to date  Reports are verified by the lead agency    Yes   No   N/A     Yes   No   N/A
	Specific requirements in deed or decision documents have been met  Violations have been reported  Yes No N/A  Yes No N/A
	Other problems or suggestions:  Per IC Document SOPA (Admin) New London Instruction 5090.18C (December 2006) contractors shall contact the Public Works Engineering Division prior to operation or storage of heavy equipment on Site 6. The IR Program Manager will provide guidance for projects proposing ground surface disruption, subsurface excavation penetration, or dewatering work.
2. A	equacy
D. (	eneral
1.	Vandalism/trespassing ☐ Location shown on site map ☐ No vandalism evident  Remarks
2.	Land use changes on site N/A Remarks .DRMO may be moved and land use changed to parking lot for Yacht Club.
3.	Land use changes off site  N/A Remarks
	VI. GENERAL SITE CONDITIONS
A. F	pads
1.	Roads damaged

	Other Site Conditions	
	Remarks <u>Depressions in</u>	asphalt outside of capped area.
		· .
		NDFILL COVER
A. L	andfill Surface	
1.	Settlement (Low spots)	☐ Location shown on site map ☐ Settlement not evident
	Areal extent	Depth
	Remarks,	
2.	Cracks	☐ Location shown on site map ☐ Cracking not evident
	Lengths	Widths Depths
	Remarks Minor. Overall,	pavement in capped area in good condition.
•	Erosion	☐ Location shown on site map ☐ Erosion not evident
	Areal extent	
	Remarks	
•	Holes	☐ Location shown on site map ☐ Holes not evident
	Areal extent	Depth
	Remarks	
•	Vegetative Cover	☐ Grass ☐ Cover properly established ☐ No signs of stress
	☐ Trees/Shrubs (indicate	size and locations on a diagram)
	Remarks Not applicable.	
	Alternative Cover (armor	red rock, concrete, etc.)
	Remarks <u>Did not inspect ri</u>	prap outside jersey barrier.
	Bulges	☐ Location shown on site map ☐ Bulges not evident
	Areal extent	Height
	Remarks	

8.	Wet Areas/Water Damage	e ☐ Wet areas/v	water damage not evident	
	☑ Wet areas	☐ Location sh	nown on site map Area	l extent
	□ Ponding	☐ Location sh		l extent
	☐ Seeps	☐ Location sh		extent
	☐ Soft subgrade	☐ Location sh		extent
	Remarks Water ponded/bloo	cked along jersey barrie	ers at top of shoreline.	
9.	Slone Instability [7] (1)			
).	Slope Instability SI  Areal extent		wn on site map No e	vidence of slope instability
	Remarks	<del></del>		
В.	Benches	☐ Applicable	⊠ N/A	
C.	Letdown Channels	☐ Applicable	⊠ N/A	
D.	Cover Penetrations		□ N/A	
1.	Gas Vents	☐ Active	☐ Passive	
-	☐ Not Properly secured/lock	ked	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at pe	netration	☐ Needs Maintenance	
	⊠ N/A			
	Remarks			
2.	Gas Monitoring Probes			
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at per		☐ Needs Maintenance	⊠ N/A
	Remarks			
3.	Monitoring Wells			
	☐ Properly secured/locked	☑ Functioning	☑ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at per		Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     ■     Needs Maintenance     Needs Mai	□N/A
	Remarks Concrete around 6			
	10D need to be corrected on r	nap. 6MW7S dry but i	n depressed location. Can	not find 6MW4S.
4.	Leachate Extraction Wells			
	☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at per	etration	☐ Needs Maintenance	⊠N/A
	Remarks			· · · · · · · · · · · · · · · · · · ·

5. Settlement Monuments	☐ Located	☐ Rout	inely surveyed	⊠ N/A
Remarks				<del></del>
E. Gas Collection and Treatment	☐ Appli	cable	⊠ N/A	
F. Cover Drainage Layer		cable	⊠ N/A	
G. Detention/Sedimentation Ponds		☐ Applicable	⊠ N/A	
H. Retaining Walls	☐ Applicable	⊠ N/A		
I. Perimeter Ditches/Off-Site Disc		Applicable	□ N/A	
	Location shown of			ation not evident
Areal extent	Depth		•	
Remarks <u>Debris in perimete</u>	r channel (pallet, de	bris).		
2. Vegetative Growth	Location shown or	n site map	N/A	
	Vegetation does no	ot impede flow	1	
Areal extent				
Remarks	• •			
3. Erosion	Location shown or	site map	⊠ Eros	ion not evident
Areal extent				
Remarks		· · · · · · · · · · · · · · · · · · ·		
	Functioning			
Remarks <u>Drop inlet in good control on it for tides.</u>	condition. Leaves	near inlet she	ould be removed	l. Outlet pipe has
control on it for tides.				<u> </u>
J. Monitoring Wells (off site)				
☐ Properly secured/locked	☐ Functioning	☐ Routine	ely sampled	☐ Good condition
Evidence of leakage at pen			Maintenance	□N/A
Remarks Monitoring wells 6				
		3 440 1114000551	to seem	ay restrictions.
VIII. VERTICAL B	ARRIER WALLS	☐ Appli	cable 🔻 🖸	] N/A
IX. GROUNDWATER/SUF	RFACE WATER R	EMEDIES	☐ Applicable	. ⊠ N/A
	X. OTHER R	EMEDIES	- "	
If there are remedies applied at the site physical nature and condition of any facextraction.	which are not cover cility associated wit	red above, atta h the remedy.	ch an inspection An example wou	sheet describing the ald be soil vapor

XI. OVERALL OBSERVATIONS
A. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The remedy is successfully preventing unacceptable risks to human receptors from exposure to contaminated soil and preventing unacceptable risk to ecological receptors in the Thames River from potential migrating contaminants.
B. Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.  The cap, pavement, perimeter channel, and drop inlet are in good condition and are effective in providing current and long-term protectiveness. Some well maintenance is needed.
C. Early Indicators of Potential Remedy Problems
Toblems
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.  None.
However, some monitoring well maintenance is needed for effective site evaluation.

D. Opportunities for Optimization	
Describe possible opportunities for optimization in monitoring tasks or the operation of the	e remedy.
Based on 7 years of monitoring and statistical evaluation, the contaminants are not migrati well monitoring should be reduced from annually to every 2 or 5 years.	ng; therefore,
Unnecessary or unused wells should be abandoned.	
A final groundwater Record of Decision (ROD) should be prepared.	
	<del></del>

### **Inspection Team Roster for Site6 DRMO**

Corey Rich of Tetra Tech NUS, Inc.

Nina Balsamo of Tetra Tech NUS, Inc.

Kymberlee Keckler of USEPA Region I

Mark Lewis of CTDEP

Robert Tess of ECC

Greg Kemp of Gannett Fleming (as a representative of USEPA Region I)

Mark Evans, EFANE

C.3 GOSS COVE LANDFILL

I. SITE I	NFORMATION
Site name: Site 8 - Goss Cove Landfill	Date of inspection: 4/3/06 and 4/4/06
Location and Region: New London County, CT	EPA ID: CTD98096515
Agency, office, or company leading the five-year review: EFANE/EPA Region 1	Weather/temperature: Sunny on 4/3/06, 50s; overcast, winds, and drizzle on 4/4/06, 40s
Remedy Includes: (Check all that apply)	
□ Landfill cover/containment	☐ Monitored natural attenuation
□ Access controls	☐ Groundwater containment
☑ Institutional controls	☐ Vertical barrier walls
☐ Groundwater pump and treatment	
☐ Surface water collection and treatment	
☑ Other <u>Monitoring program to determin</u>	ne final remedy for groundwater operable unit. Landfill
gas yents, and storm drain structures.	
ttachments:  Inspection team roster attached	☐ Site map attached
II. INTERVIEW	S (Check all that apply)
O&M site manager Richard Conant	REC/IR Program Manager 4/3/06
Name	Title Date
terviewed at site at office by phone	Phone no. <u>(860)694-5649</u>
oblems, suggestions; Report attached	
O&M staff Rob Tess, ECC (508)229-2270; Mark F	Evans, EFANE (610)595-0567 ext 162 4/4/06
Name	Title Date
erviewed at site at office by phone P	Phone no
oblems, suggestions; Report attached	

Name  Problems; suggestions; ☐ Report attached No  Agency CTDEP  Contact Mark Lewis RPM  Name  Problems; suggestions; ☐ Report attached No of the	Title comments de	Date uring inspection.	Phone no.
Problems; suggestions; Report attached No  Agency CTDEP  Contact Mark Lewis RPM  Name	Comments de	uring inspection.	
Agency <u>CTDEP</u> Contact <u>Mark Lewis</u> <u>RPM</u> Name	Title	4/4/06	
Contact Mark Lewis RPM Name	Title		(860)424-2768
Contact Mark Lewis RPM Name	Title		(860)424-2769
Contact Mark Lewis RPM Name	Title		(860)424-3768
Name	Title		
Problems; suggestions; Report attached No c		Date	Phone no.
	comments do		
	CAMBINITIES UL	ши <u>к шъресион.</u>	
Agency			
Contact			
3.7	Title	Date	Phone no.
roblems; suggestions; Report attached			
gency			
ontact	<del></del>	-	
Name	Title	Date	Phone no.
roblems; suggestions;  Report attached			

III. ON-SITE DO	OCUMENTS &	RECORDS VERIFIEI	D (Check all that app	ly)
1. O&M Documents  O&M manual	□ Readily ava	ilable ⊠Up	to date	
☐As-built drawings ☐ Maintenance logs Remarks	⊠Readily avai ⊠Readily avai	P	to date \Bigcup N. to date \Bigcup N.	
2. Site-Specific Health and Safet	y Plan	☐ Readily available	☐ Up to date	
☐Contingency plan/emergency Remarks	response plan	☐ Readily available	☐ Up to date	⊠N/A
3. O&M and OSHA Training Re Remarks		Readily available	□Up to date	⊠N/A
4. Permits and Service Agreemen	nts		7 10	
☐ Air discharge permit☐ Effluent discharge☐ Waste disposal, POTW☐ Other permits☐ Remarks☐	□Readily avail □Readily avail □Readily avail □Readily avail	able U	Jp to date ⊠ N/A Jp to date ⊠N/A Jp to date ⊠N/A Jp to date ⊠N/A	· •
5. Gas Generation Records Remarks		☐Readily available	☐Up to date	⊠N/A
5. Settlement Monument Records Remarks		☐Readily available	☐Up to date	⊠N/A
7. Groundwater Monitoring Reco Remarks Monitoring is now p sampling performed June throug	erformed quarter	⊠Readily available rly. Round 14 GMR enext round of sampling	☐Up to date was issued January was due in October	□N/A 2006 for 2005.
8. Leachate Extraction Records Remarks		☐Readily available	☐Up to date	⊠N/A
. Discharge Compliance Records				
	□Readily availal □Readily availal		to date N/A to date N/A	
0. Daily Access/Security Logs Remarks		Readily available	☐Up to date	⊠N/A

<u></u>	22110				IV. 0&M CO	OSTS	
1	☐ State ☐ Feder ☐ Other	rganization in-house ral Facility i TtNUS pre dwater mon	n-ho	use <u>d ground</u> wa	ractor for State ter monitoring pl rformed recent gr	☐ PRP in-house ☑ Contractor for Federan and O&M manual are coundwater monitoring a	nd performed first year
2.	☐ Read Original	<u>\$2</u>	le : estir 21,50	00 every 5 y	00 for O&M plus ears for 5-year re		n/agreement in place d
	Total an	mual cost by	y yea	r for review	period if availab	le	
	From 1	/2003 Date	To	12/2003 Date	\$13,139 Total cost	Breakdown attac	hed
	From _1	Date		12/2004 Date	\$20,311 Total cost	Breakdown attac	hed
	From <u>1</u> From _	Date	-	12/2005 Date	\$20,989 Total cost	☐ Breakdown attac	
	From	Date	To_ To_	Date	Total cost	□ Breakdown attac	
	From	Date Date	To_	Date Date	Total cost	☐ Breakdown attacl	
3.	\$169,000 evaluatio	costs and to \$191,0 n.	reaso 00 p	ons: Long to per year in	addition to O&	g Review Period costs for Year 1 (2002) M sampling, analysis, 520,000 per year.	to Year 4 (2005) of data validation, and
	× * * * * * * * * * * * * * * * * * * *	- Communicu	Ioun	uwatei mon	noring cost was a	520,000 per year.	
A. Fen		ESS AND	INST	TITUTION	AL CONTROL	S Applicable	□ N/A
1.	Fencing	damaged Fence in go	od co	Location Br	on shown on site ranches leaning a	map	red N/A tion.
B. Oth	er Access	Restriction	s				
1.	Signs and Remarks	d other secu Site is oper	ırity 1 to tl	measures he public.	☐ Locat	ion shown on site map	□ N/A

C. I	Institutional Controls (IC:	s)				
1.	Implementation and Site conditions imply I Site conditions imply I	enforcement Cs not properly implemented Cs not being fully enforced		s 🛭 No		
	Frequency <u>Quarterly</u>	g., self-reporting, drive by) <u>I</u>				
	Responsible party/ager	cy Naval Submarine Base -	New London	<del></del>		<del></del>
	Contact <u>Richard Cona</u>	int IR Ma	nager			
	Nar	ne	Title	Date	P	hone no.
	Reporting is up to date Reports are verified by	the lead agency			□ No ☑ No	□ N/A
	Specific requirements in Violations have been re	n deed or decision documents ported	have been met	⊠ Yes □ Yes	□ No □ No	□ N/A 図 N/A
	Other problems or sugg Sailor stopped team to a	estions: usk the nature of our business.		☐ Repo	rt attach	ed
Ade	proposing ground surface	t the public works engineeri lite 8. The IR program me disruption, subsurface exca	nanager will provation, or dewate	vide guid ring work	ance for	er 2006) storage of projects
Ade	Houry equipment on S	one of the literation of the literature of the l	vation, or dewate	vide guid ring work	C.	
	proposing ground surface	e disruption, subsurface exca	vation, or dewate	vide guid ring work	ance for	
Ge	proposing ground surface  equacy  Remarks	□ Location shows	vation, or dewate	vide guid ring work	N/A	
. Ge	proposing ground surface equacy Remarks  vandalism/trespassing Remarks  Land use changes on signature.	□ Location shown	anager will provation, or dewate	vide guid ring work  quate	N/A	storage of projects
. Ge	equacy Remarks  Proposing ground surface  Remarks  Proposing ground surface  Remarks  Remarks  Land use changes on sing Remarks Empty concrete  Land use changes off sing Remarks Fusconi Dry Cl	Location shows  Location shows    N/A	anager will provation, or dewate	quate [	No vanda	alism evide
. Ge	equacy Remarks  Parental  Vandalism/trespassing Remarks  Land use changes on sin Remarks Empty concrete  Land use changes off sin Remarks Fusconi Dry Cland a second injection is	Location shown  Location shown	anager will provation, or dewate	quate [	No vanda	alism evide
	equacy Remarks  Proposing ground surface  Pr	Location shown  Location shown	anager will provation, or dewated vation, or dewated vation. It is a reinaded in on site map and isplay was renular analysis reports a comprogress reports	quate [	No vanda	alism evide

D. \	Other Site Conditions	
	Remarks Storage area north improperly stored there. Mate	of parking lot has locked gate, but hazardous materials are being
	emproperty stored there. Whate	errais not locked in locker.
	corrected.	ctly located on map. Gun display is not present - site map to be
	VII. LANDF	ILL COVER
A. I	Landfill Surface	
1.	Settlement (Low spots)	☐ Location shown on site map  ☐ Settlement not evident
	Areal extent	Depth
	Remarks	
2.	Cracks	☐ Location shown on site map ☐ Cracking not evident
	Lengths Wid	lths Depths
	Remarks Wearing surface in go	ood condition.
•	Erosion	☐ Location shown on site map ☐ Erosion not evident
	Areal extent	
	Remarks	
	Holes	☐ Location shown on site map ☐ Holes not evident
	Areal extent	
	Remarks	
	Vegetative Cover G	rass
	☐ Trees/Shrubs (indicate size a	
	Remarks	
	Alternative Cover (armored ro	ock, concrete, etc.)
	Remarks	
	Bulges	☐ Location shown on site map ☐ Bulges not evident
		☐ Location shown on site map ☐ Bulges not evident
	Areal extent	Height

8.	Wet Areas/Water Damage	N. W.	,	
	☐ Wet areas		water damage not ev	rident
		☐ Location s	hown on site map	Areal extent
	☐ Ponding	☐ Location s	hown on site map	Areal extent
	☐ Seeps	☐ Location sl	hown on site map	Areal extent
	☐ Soft subgrade	☐ Location sl	hown on site map	Areal extent
	Remarks			
			· · · · · · · · · · · · · · · · · · ·	
9.	Slope Instability	es   Location sho	own on site map	No evidence of slope instability
	Areal extent	<u> </u>		
	Remarks			· 
B. Be	enches	☐ Applicable	⊠ N/A	
C. Le	etdown Channels	☐ Applicable	⊠ N/A	
D. Co	over Penetrations		□ N/A	
1.	Gas Vents	☐ Active	☐ Passive	
	☑ Not Properly secured/locked			-1.4 <b>5</b> 10 1 111
	☐ Evidence of leakage at pene			
	□ N/A	in action	☐ Needs Mainten	ance
	Remarks Two of three vents a vents need screens. Invasive vents that fits monitoring well locks.	are in fenced areas egetation on fence a	with gates. Gates no round Gas Vent M.	eed locks and all three gas Need locks with same key
2.	Gas Monitoring Probes			
	☐ Properly secured/locked	☐ Functioning	☐ Routinely samp	led Good condition
	☐ Evidence of leakage at penet		☐ Needs Maintena	·
	Remarks		1 reeds Maintena	ance N/A
			· · · · · · · · · · · · · · · · · · ·	
3.	Monitoring Wells			
	☑ Not Properly secured/locked	☐ Functioning	☑ Routinely sampl	lat Do t iii
	☐ Evidence of leakage at penetr			
			Needs Maintena	
	Remarks Concrete pads and bo 8MW5S cap so it can be lock 8MW10S buried under top soil r	eu internaliv XMV	NI XMXX// and OX/	MW2S. Need to replace IW5S are missing bolts.

4.	Leachate Extraction Well	ls		
	☐ Properly secured/locked	I ☐ Functioning	Routinely sampled	☐ Good condition
	☐ Evidence of leakage at p		☐ Needs Maintenance	⊠N/A
	Remarks			⊠IV/A
5.	Settlement Monuments	☐ Located	☐ Routinely surveyed	⊠ N/A
	Remarks			
	as Collection and Treatment			
	over Drainage Layer	☐ Applicab		
	etention/Sedimentation Ponds	☐ Applicab		NO ACCESS
			Applicable N/A	
	etaining Walls erimeter Ditches/Off-Site Disc	Applicable	⊠ N/A	
	041	charge ☐ Ap  Location shown on si		NO DITCHES
	<u> </u>			tion not evident
•	Areal extentRemarks			
	Tomarks			·
	Vagatativa Canada	1.		
	Vegetative Growth		——	
		Vegetation does not in	_ ,	
	Areal extent	- JP - DOOTALIV	e vegetation near propeller	Display.
	Remarks Sprinkler system is would add significant infiltra	s exposed and damaged	Use of sprinkler system w	hile it is damaged
	about the problem and it has t	been or will be corrected	d. Use of the sprinkler system	seum was notified
	healthy grass cover.			THE THE THE THE TENT A
	Erosion			
	Areal extent	Location shown on site	e map	on not evident
	Remarks	Depth		
	ACHIGIAS			
	Discharge Structure	Function		
	-	Functioning	□ N/A	
	Remarks <u>Parking lot drains</u> culvert or other inspection tecl	hnique may be required	additional video inspection	of drains to box
Mo	nitoring Wells (off site)			
	☐ Properly secured/locked	☐ Functioning [	☐ Routinely sampled	☐ Good condition
	☐ Evidence of leakage at pen		<ul> <li>✓ Needs Maintenance</li> </ul>	
			A recers maintenance	□N/A
	Remarks Monitoring wells 81	MW1, 8MW4, RMW59	8MW9S and 9MW110S	

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A
IX. GROUNDWATER/SURFACE WATER REMEDIES   Applicable   N/A
X. OTHER REMEDIES
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.
XI. OVERALL OBSERVATIONS
A. Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The remedy effectively protects humans from exposure to contaminated soil and prevents unacceptable risk to ecological receptors in the Thames River and Goss Cove from potential migration of contaminants.
B. Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
Landfill cap, gas vents, culverts, and drains are in good condition and provide current and long-term protectiveness. All gas vents need screens and two of the gas vents need locks for their fence gates. Some well maintenance is needed. Overall, the site is in very good condition.
C. Early Indicators of Potential Remedy Problems
Describe issues and observations such as unexpected changes in the cost or soons of ORM
of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.  It needs to be established whether or not the sprinkler system is broken and whether or not if it is used.  If used but broken, it could introduce infiltration beneath the cap.
minimum beneath the cap.

D.	Opportunities for Optimization
<u>Ba</u>	escribe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>sed on 3 years of monitoring and statistical evaluation, the contaminants are not migrating; therefore, and the monitoring should be reduced from quarterly to annually.</u>
	necessary or unused wells should be abandoned.
<u>A</u> :	final groundwater Record of Decision (ROD) should be prepared.

## **Inspection Team Roster for Site 8 Goss Cove Landfill**

Corey Rich of Tetra Tech NUS, Inc.

Nina Balsamo of Tetra Tech NUS, Inc.

Kymberlee Keckler of USEPA Region I

Mark Lewis of CTDEP

Robert Tess of ECC

Greg Kemp of Gannett Fleming (as a representative of USEPA Region I)

Mark Evans, EFANE

#### **APPENDIX D**

SOPA (ADMIN) NEW LONDON INSTRUCTION 5090.18C

INSTALLATION RESTORATION SITE USE RESTRICTIONS
AT NAVAL SUBMARINE BASE NEW LONDON



NEW LONDON INSTRUCTION 5090.18C

Commanding Officer, Naval Submarine Base New London

Subj: INSTALLATION RESTORATION SITE USE RESTRICTIONS AT NAVAL SUBMARINE BASE NEW LONDON, GROTON, CONNECTICUT

Ref:

- (a) Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)
- (b) Superfund Amendments and Reauthorization Act of 1986 (SARA)
- (c) OPNAVINST 5090.1B (current version)
- (d) Resource Conservation and Recovery Act (RCRA)
- (e) Connecticut Department of Environmental Protection Remediation Standard Regulations
- (f) Federal Facility agreement under CERCLA 120, In the matter of the US Department of the Navy, SUBASENLON, Groton, Connecticut, January 1995
- (g) Record of Decision, Source Control Operable Unit, Area A landfill, SUBASENLON, Groton, Connecticut, September 1995
- (h) Record of Decision for Site 8 Goss Cove Landfill, Soil and Sediment, SUBASENLON, Groton, Connecticut, February 1998
- (i) Interim Record of Decision for Sites 3, 7, 14, 15, 18 and 20 Groundwater, Groton, Connecticut, December 2004
- (j) Land Use Control (LUC) Remedial design for Sites 3 and 7 Groundwater, SUBASENLON, Groton, Connecticut, June 2005
- (k) Public Works Department Instruction 11000.1A
- (1) Record of Decision for Site 6 Defense Reutilization and Marketing Office - Operable Unit 2, SUBASENLON, Connecticut, December 2006
- (m) Operations and Maintenance Manual for Installation Restoration Program Sites at SUBASENLON, Groton, Connecticut, Volumes I, II, III, IV, and V, January 2006
- (n) Final Lower SUBASE Remedial Investigation Report, SUBASENLON, Groton, Connecticut 1999
- (o) Area A Landfill Allowable Loading Pressure, SUBASENLON, November 2006

#### SOPA(ADMIN)NLONINST 5090.18C 14 Dec 06

- Encl: (1) Defense Reutilization and Marketing Office (DRMO)
  Installation Restoration Site and Landfill Cap Site 6
  - (2) Area A Landfill Installation Restoration Site and Landfill Cap Site 2A
  - (3) Installation Restoration Site Map for SUBASENLON
  - (4) Excavated Soil Management for Installation Restoration Sites at SUBASENLON
  - (5) Management of Dewatering Wastewaters for Installation Restoration Sites at SUBASENLON
  - (6) Goss Cove Landfill Installation Restoration Site and Landfill Cap - Site 8
- 1. Purpose. This instruction defines the Naval Submarine Base New London (SUBASENLON) policy regarding ground surface disturbance of soils/sediments or any subsurface disturbance of soils/sediments and/or groundwater extraction in Installation Restoration (IR) sites and the disturbance of any remedial infrastructure, including monitoring wells and waste caps. Disturbance is defined as any form of damage to remedial infrastructure, excavation, soil penetration, soil compaction, filling, or change of topography. The definition of disturbance also includes any proposed action to dewater excavations or extract/expose groundwater for discharge, consumption, or use in any way. This instruction is intended to enact institutional controls that are specified in references (a) through (o).
- 2. <u>Applicability</u>. This instruction is applicable to all Navy departments, tenant commands, contractors, invitees, and personnel at SUBASENLON.
- B. Cancellation. SOPA (ADMIN) NLONINST 5090.18B.
- 4. <u>Discussion</u>. In accordance with references (a) through (o), the SUBASENLON IR Program manages the identification, characterization and cleanup of contaminated soils, sediments and groundwater at specific SUBASENLON IR locations. The existing IR sites at SUBASENLON are in various stages of the IR investigation and cleanup process. Specialized landfill caps have been installed over the former landfill at the Defense Reutilization and Marketing Office (DRMO) site, see enclosure (1); the former landfill at the Area A site, see reference (g); the former Goss Cove landfill, see reference (h); and a small area of Area A Downstream, see enclosure (3) in order to isolate

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contaminated soils and sediments from the surrounding environment. These caps can be damaged by the operation or storage of heavy equipment on the cap surface or by unauthorized excavation or penetration through the cap surface.

- Enclosures (1), (2), (3), and (6) outline the extent of the former landfill sites, the current landfill caps, and the contamination at Area A downstream. Enclosure (3) depicts the boundaries of all other identified IR sites at SUBASENLON and areas where groundwater use controls and restrictions are in effect. Groundwater and surface water shall not be extracted and used for any purpose at SUBASENLON. All areas indicated in enclosures (1), (2), (3) and (6) may contain contaminated soil, sediment or groundwater, which can potentially threaten human health or the environment if disturbed by unauthorized excavation or dewatering. Work can be safely conducted within the boundaries of identified IR sites, but proper planning, coordination, preparation, and safety measures must be implemented in accordance with federal and state laws. work requires strict adherence to a site-specific health and safety plan, proper training of site workers, correct use of personal protective equipment by site workers, and proper management of any generated waste.
- Enclosures (4) and (5) provide guidance for excavation and dewatering in IR sites at SUBASENLON. Reference (m) provides requirements and guidance for the protection and maintenance of all IR sites identified in enclosure (3) and their associated structures, e.g., landfill cap asphalt wearing surfaces, landfill cap toe-slope protection, diversion channels, gas management vents, stormwater conveyances, material handling and storage pads, monitoring wells, and site perimeter fencing. Note that monitoring wells are not exclusively situated within the boundaries of the IR sites depicted in enclosure (3). All such structures shall not be modified, disturbed, or in any way affected without coordination with the SUBASENLON Environmental Department. The periodic and routine maintenance of all IR sites and their associated structures, will be accomplished in strict adherence to reference (m) by authorized Navy contractors. The operation of equipment and storage of materials within any IR site identified in enclosure (3) shall also be in compliance with reference (m).
- 5. Action. Prior to the operation or storage of any heavy equipment at the sites depicted in enclosures (1) and (6), all

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SUBASENLON departments, tenant commands, Navy contractors, and personnel shall contact SUBASENLON Public Works and Environmental Departments, which will determine general landfill cap loading restrictions for all equipment/materials to be operated or stationed on these landfill caps.

- The Area A Landfill Installation Restoration Site and Landfill Cap - Site 2A depicted in enclosure (2) is a restricted area controlled by SUBASE Command Master-at-Arms (CMAA). requests for access to the Area A and for the storage of any heavy equipment/ materials at Area A will be referred to the CMAA office. The CMAA office will coordinate all heavy equipment/materials storage requests with the SUBASENLON Public Works and Environmental Departments prior to authorizing any storage of heavy equipment/materials at the site. The loading guidance provided in enclosure (o) shall be utilized to assess storage of heavy equipment/material on the Area A landfill cap site. Precaution must be taken to ensure that any equipment operated and/or stationed on the three landfill caps will not damage the asphalt wearing surface to any appreciable degree. Damage to the asphalt wearing surfaces at the landfill caps must be reported immediately to the SUBASENLON Environmental Department.
- Any SUBASENLON department, tenant command or Navy contractor planning projects involving subsurface excavation, subsurface penetration of the soil, dewatering, or ground surface disturbance at the sites depicted in enclosures (1), (2), (3) and (6) shall notify the SUBASENLON IR Program Manager at 694-5649 at the earliest project planning phase and follow the dig permit directions contained in reference (k). The IR Program Manager will coordinate project review with the Naval Facilities Remedial Project Manager, the SUBASENLON Public Works Department, the Public Safety Department, and the USEPA and the CTDEP, as applicable under references (a) through (o). Based on the outcome of this coordination, the SUBASENLON IR Program Manager will provide guidance for projects proposing ground surface disruption, subsurface excavation, penetration, or dewatering work in accordance with enclosures (4) and (5). No work shall commence in IR sites until an excavation permit, as required by reference (k), is completed and signed by the IR Program Manager and the Public Works Department. The excavation permit will specify requirements for the project, detail waste

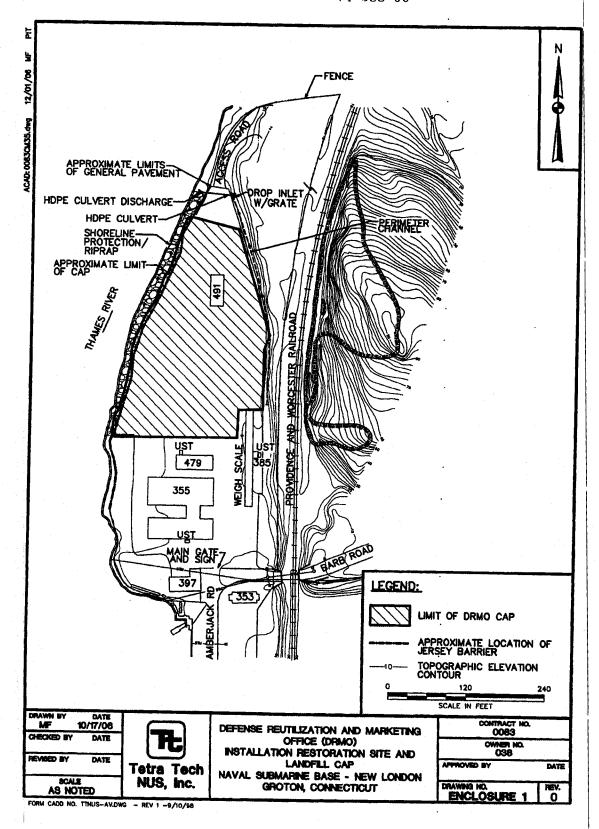
#### SOPA(ADMIN)NLONINST 5090.18C 14 Dec 06

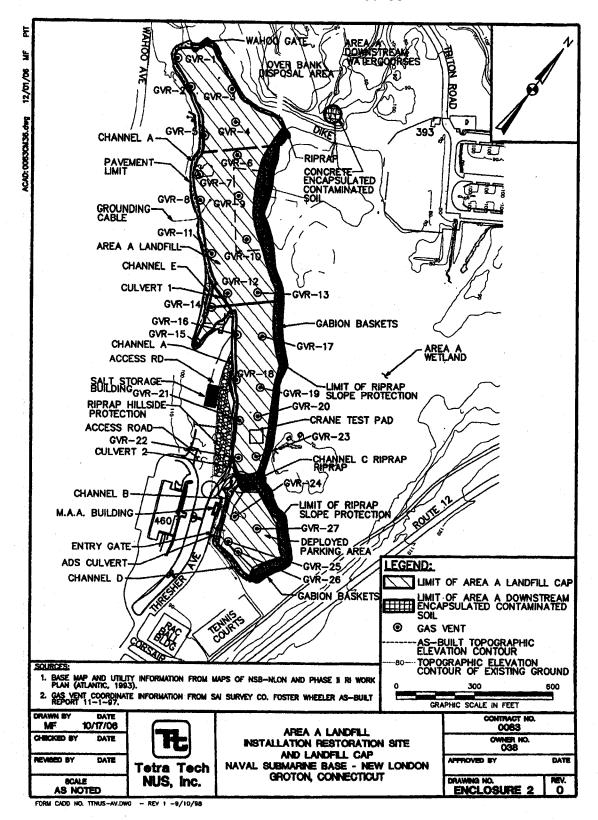
management procedures, and establish standards for protecting remedial infrastructure and restoration of the project site.

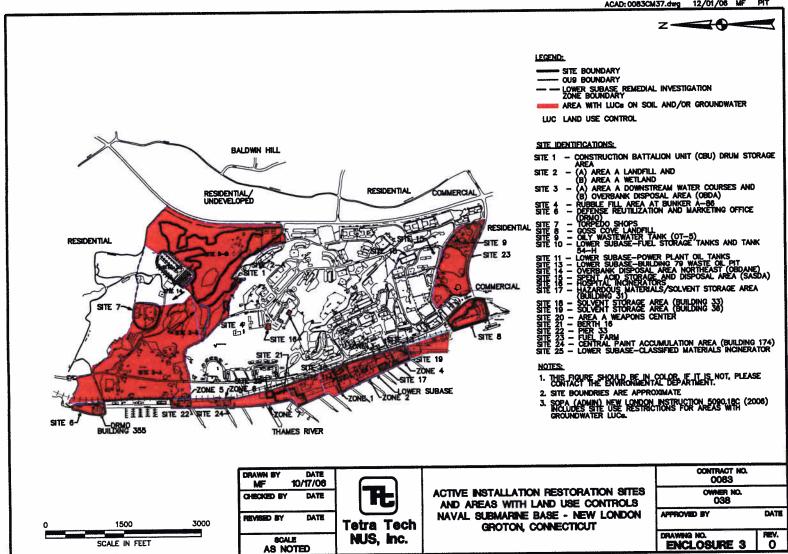
P. J. MCKENNA By direction

Distribution: (SUBASENLONINST 5216.8N)

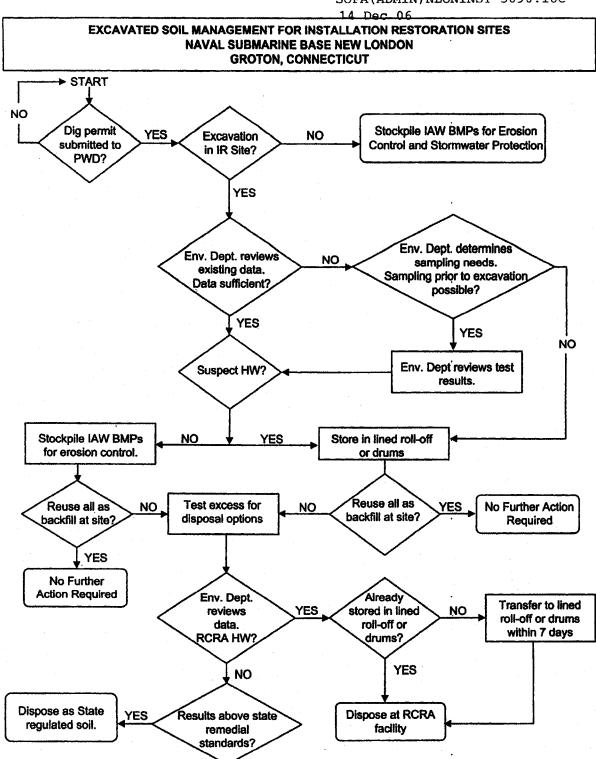
List D







**SOPA (ADMIN)NLONIST ENCLOSURE 4** 



Dispose as non-Regulated soil.

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# MANAGEMENT OF DEWATERING WASTEWATERS FOR INSTALLATION RESTORATION SITES NAVAL SUBMARINE BASE NEW LONDON GROTON, CONNECTICUT

